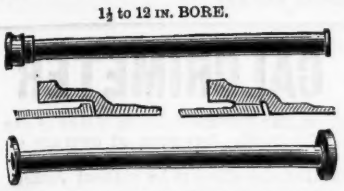
THE JOURNAL OF GAS LIGHTING
WATER SUPPLY & SANITARY IMPROVEMENT

VOL. LXVII. No. 1712.] LONDON, MARCH 3, 1896. [48TH YEAR. PRICE 6d.

GAS AND WATER PIPES

1½ to 12 IN. BORE.



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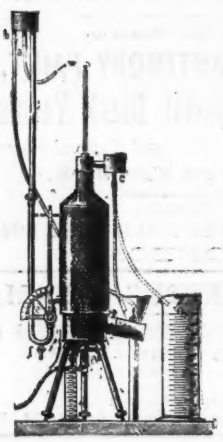

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For Description, see "JOURNAL OF GAS LIGHTING," Jan. 8, 1895.

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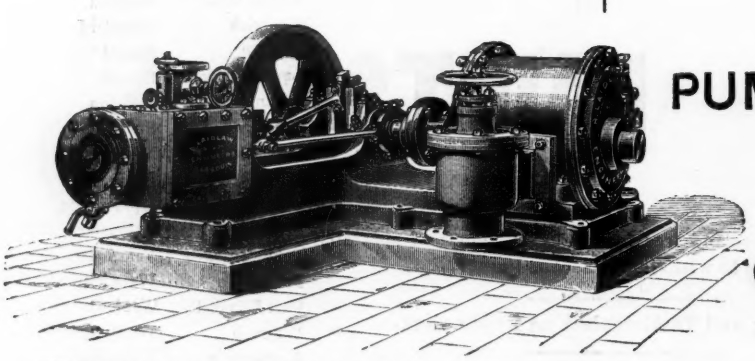

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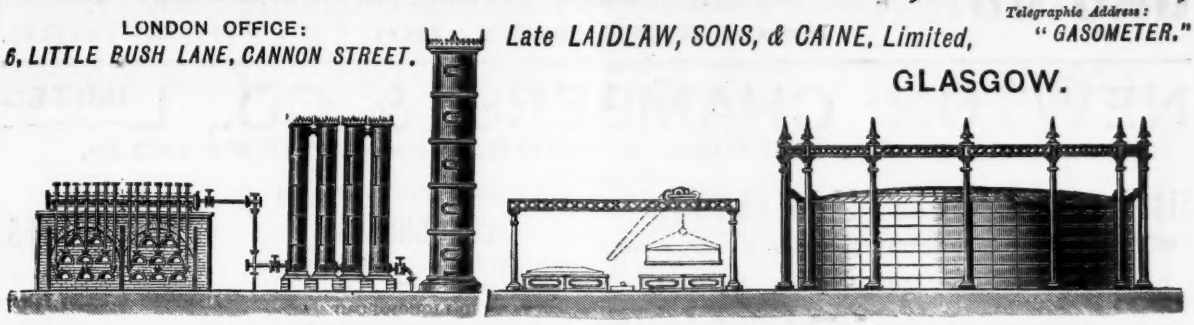

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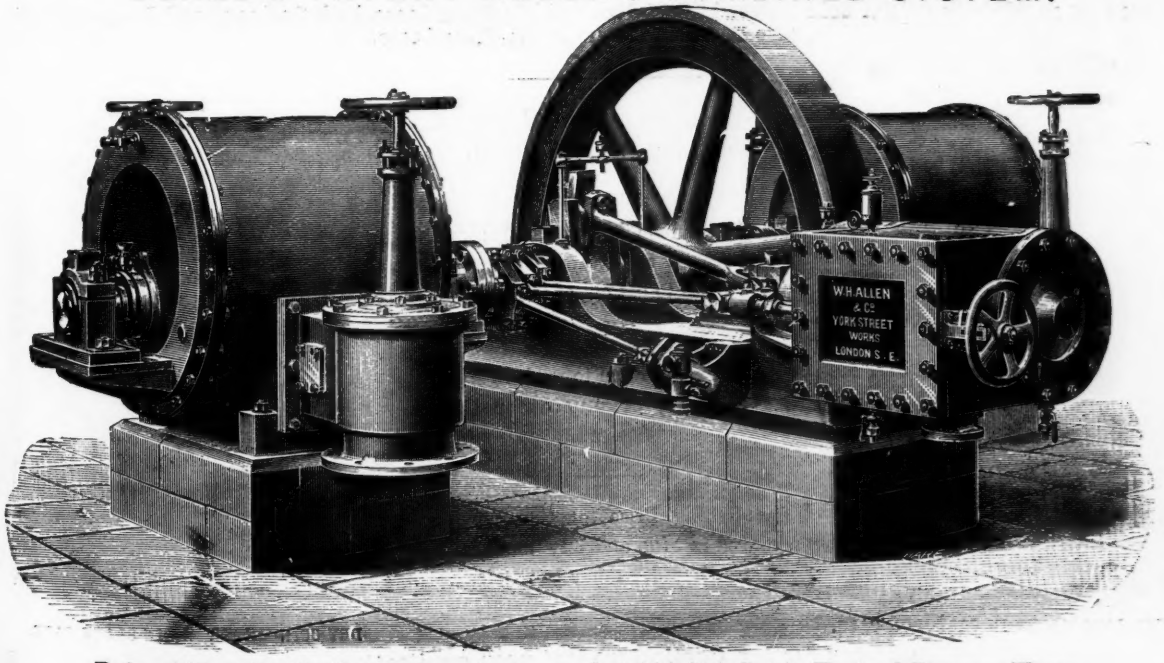

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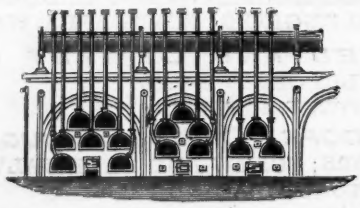

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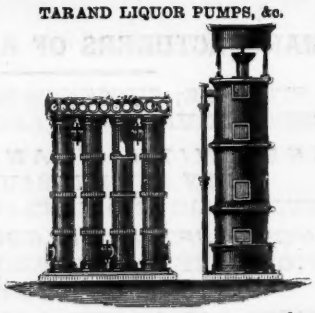

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PURIFIERS with Planed Joints,
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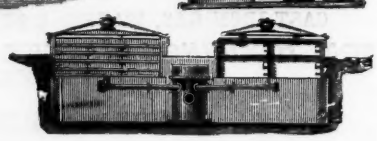

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GAS COAL FAMOUS FOR ITS UNRIVALLED EXCELLENCE.

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ORME'S PATENT IMPROVED COIN METER.

We are now supplying our Wet Coin Meters in Cast-Iron and Tin-Plate Cases, both Ordinary and Compensating; also Dry Coin Meters in Tin-Plate Cases.

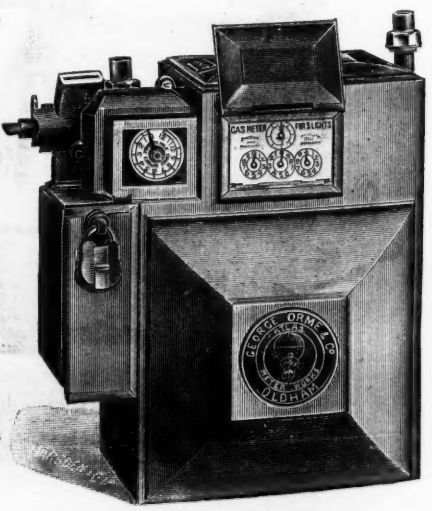
WET COIN METER IN CAST-IRON CASE.

A large number of these Meters are in use, and giving satisfaction.

The Mechanism is very simple; and there are no springs or complicated parts to get out of order.

We supply them to work with **1d., 1s., or any other Coin desired.**

The Selling Price of Gas can be changed *in Situ*, and any number of feet delivered, as may be required.



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FOR

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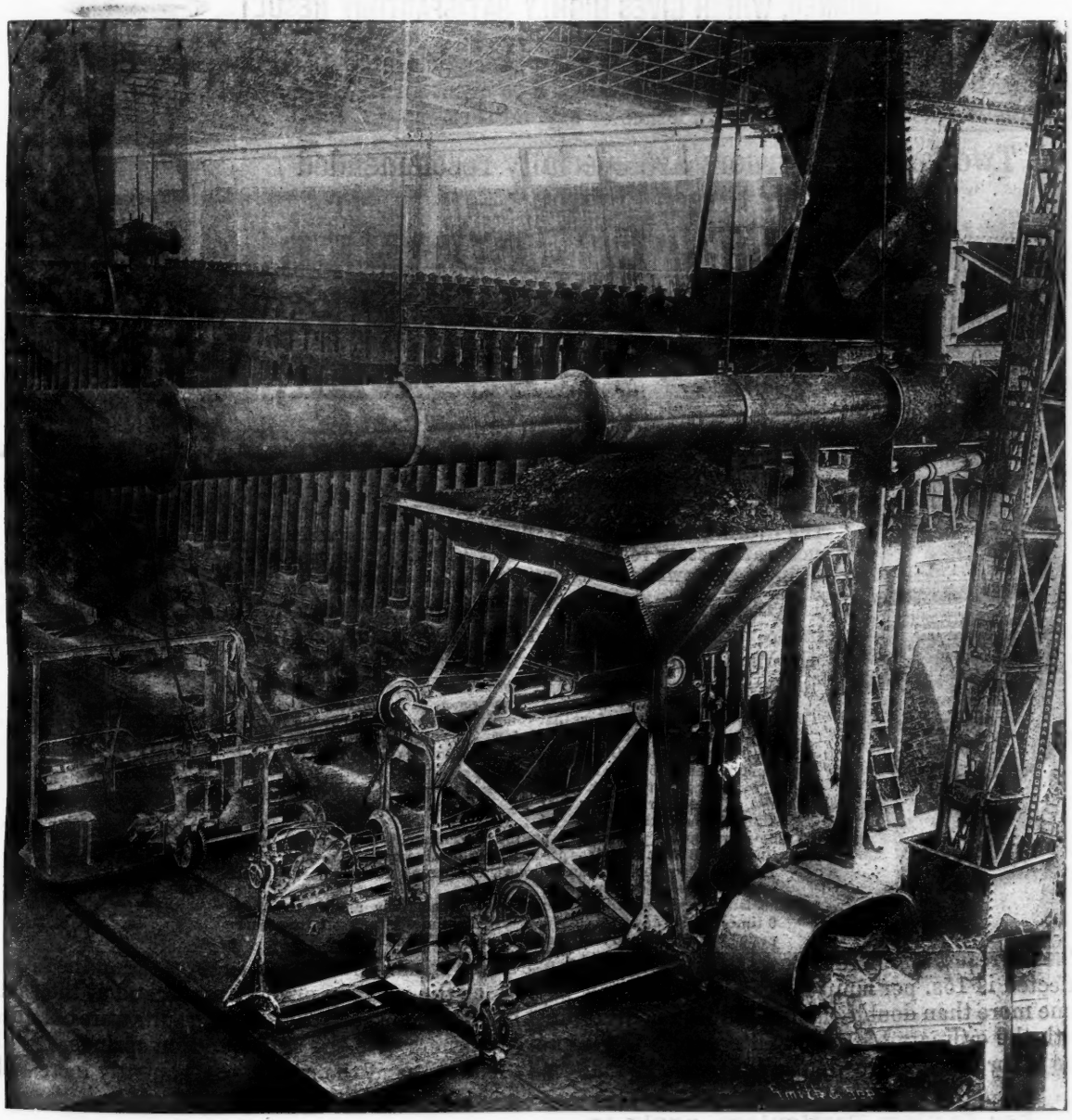
GLASGOW.

Plans and Estimates furnished on application.



The above engraving shows the interior of a Retort-House at the Tradeston Gas-Works, Glasgow, where the Machines have been at work since the beginning of 1898, drawing and charging **960 Retorts every 24 hours. 86 Drawing-Machines and 58 Charging-Machines are at work, or in course of construction.**

IMPROVEMENTS IN STREET LIGHTING.
HIGHEST EFFICIENCY WITH GREATEST ECONOMY.

LIGHTING AUTHORITIES, GAS ENGINEERS, & GAS MANAGERS

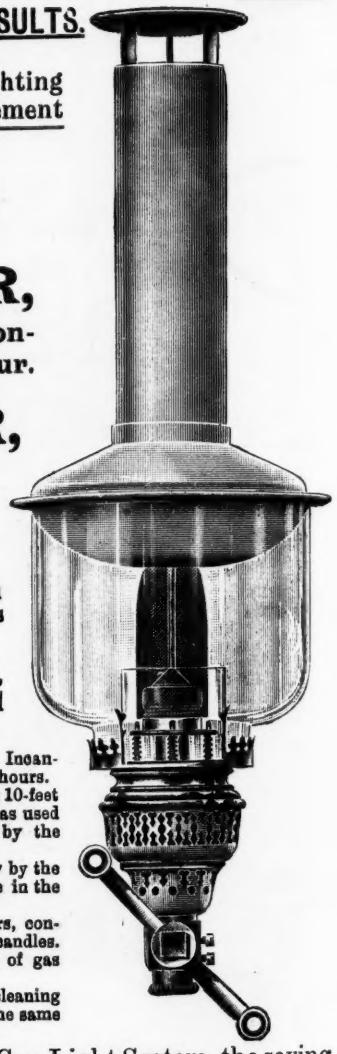
Are invited to inspect the

INCANDESCENT GAS-LIGHT

Which has now been successfully adapted to the purposes of

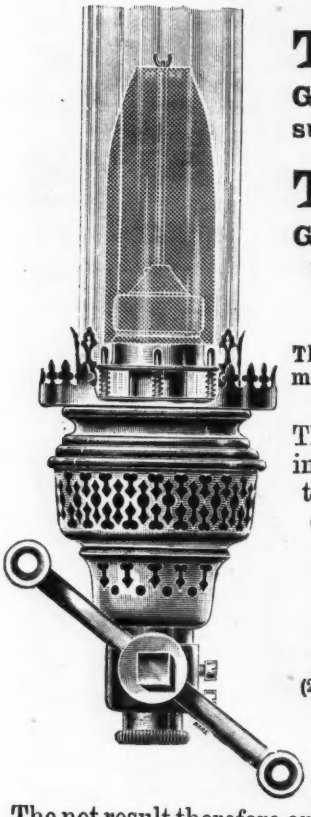
STREET LIGHTING,

THE DIFFICULTIES CAUSED BY VIBRATION HAVING BEEN OVERCOME BY THE USE OF A SPECIAL BURNER, WHICH GIVES HIGHLY SATISFACTORY RESULTS.



This System of Lighting meets the Requirements of all the Lighting Authorities in those Districts where it is desired to effect an Improvement in Street Lighting, without any increase of expenditure.

Two forms of Burners are specially recommended for Street Lighting:—



The "C" BURNER,

Giving a Light of 60 Candles, with a Consumption of 3½ Cubic Feet of Gas an Hour.

The "S" BURNER,

Giving a Light of 25 to 30 Candles, with a Consumption of 2¼ Feet of Gas an Hour.

The INCANDESCENT GAS-LIGHT has been tried with most satisfactory results for Street Lighting purposes in many Towns throughout the United Kingdom.

The Lighting Engineer of the Kensington Vestry, in a report dated the 14th of May, 1895, addressed the Works and Sanitary Committee as follows:—

(1) During the months of January, February, and March, 1895, 31 Incandescent Gas-Lamps were in use for an average period of 1167·89 hours. The estimated quantity of gas that would have been consumed by the 10-feet flat-flame burner was 11,678 cubic feet. The actual quantity of gas used by the Incandescent Gas-Light Company's Burners, as recorded by the meters, was 4415 cubic feet.
After allowing for the extra cost of up-keep, the gain to the Vestry by the use of these burners was £20 3s. 4½d., and a large increase in the Illumination of the Street.

(2) The illuminating power given by the Incandescent Gas-Burners, consuming 3·78 cubic feet of gas per hour, was found to be equal to 60 candles. That given by the flat-flame burners, consuming 10 cubic feet of gas per hour, was 26 candles.
The lanterns fitted with Incandescent Burners only require cleaning 9 times in 90 days, as compared with 26 times' cleaning in the same period required by the lanterns fitted with flat-flame burners.

The net result therefore appears to be that, by the use of the Incandescent Gas-Light System, the saving effected is 15s. per lamp for this quarter, after paying for the up-keep of the Burner, and at the same time more than double the light is obtained. It must be noted, however, that these results were obtained with the ordinary burners, and not with the improved burners with the anti-vibration springs. With the latter, the expense of up-keep would be materially reduced, and the saving consequently increased.

For further Particulars, apply to

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WEST'S GAS IMPROVEMENT COMPANY, LTD.,

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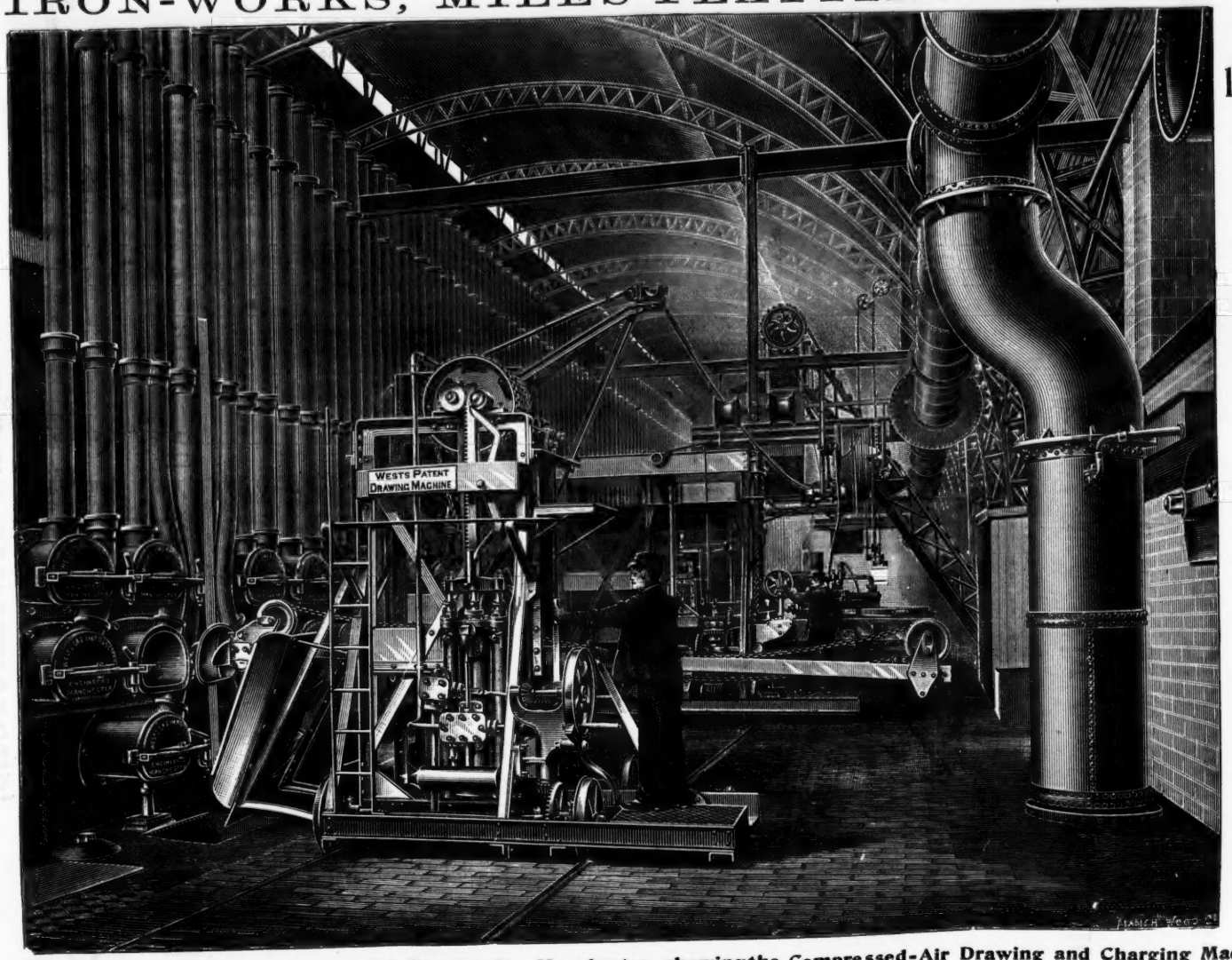
WEST'S MANUAL AND POWER MACHINERY FOR CHARGING AND DRAWING GAS-RETORTS.



Interior of Retort-House at the Bradford Road Gas-Works, Manchester, showing the Compressed-Air Drawing and Charging Machines.

AND

104, Queen Victoria St.,

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OVER 560,000 LINEAL FEET OF RETORTS DAILY ARE CHARGED AND DRAWN BY WEST'S MACHINES.

WILLEY & CO.,

GAS ENGINEERING CONTRACTORS,

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For **GASHOLDERS** and all kinds of **ENGINEERING APPARATUS.**

For **WET** and **DRY GAS CONSUMERS' METERS.**

For **COIN METERS,** their Patent Automatic is admitted to be one of the best and most reliable in the Market. Largely used in the Metropolis.

For **GAS-FITTINGS,** Registered Designs in Extensive Variety.

Manufacturers of the **LIVESEY WASHER.**

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New Works, 5 acres in extent, recently opened in the City of Exeter for the Manufacture of every kind of Apparatus used in the Production, Distribution, and Sale of Gas.

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DIAGRAMS ILLUSTRATING REPRESENTATIVE
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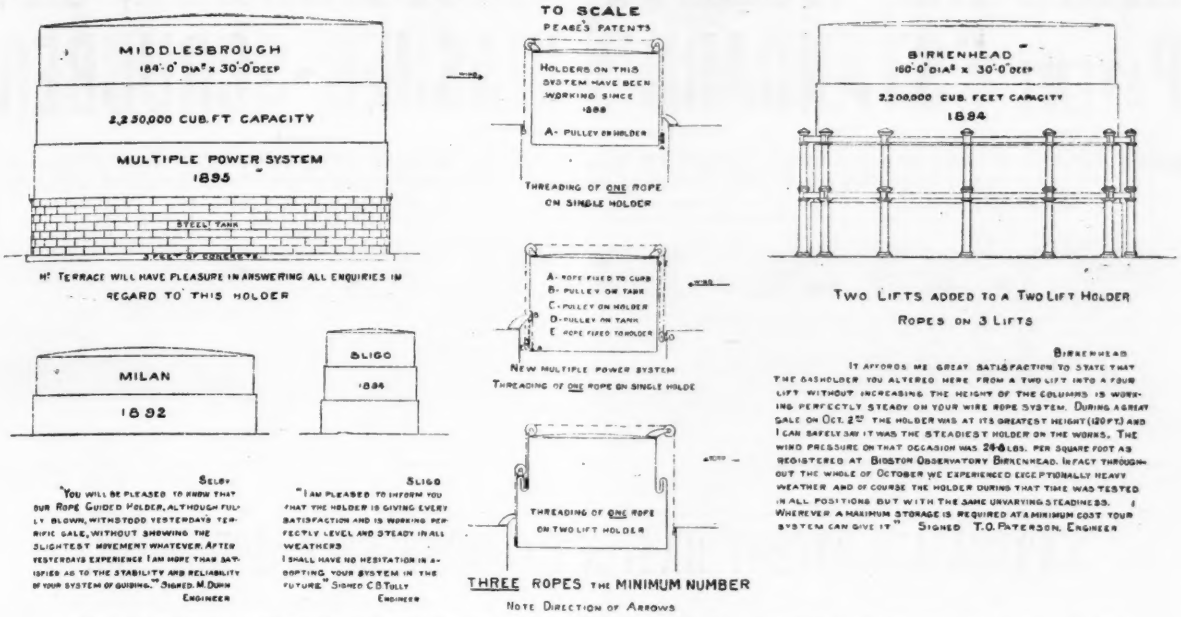

Mr Terrace will have pleasure in answering all enquiries in regard to this holder

TWO LIFTS ADDED TO A TWO LIFT HOLDER
ROPES ON 3 LIFTS

SELBY

"You will be pleased to know that our Rope Guided Holder, although fully blown, withstood yesterdays terrific gale, without showing the slightest movement whatever. After yesterdays experience I am more than satisfied as to the stability and reliability of your system of guiding." Signed M. Dunn Engineer

SLIGO

"I am pleased to inform you that the holder is giving every satisfaction and is working perfectly level and steady in all weathers. I shall have no hesitation in adopting your system in the future." Signed C.B. Tully Engineer

BIRKENHEAD

It affords me great satisfaction to state that the gasholder you altered here from a two lift into a four lift without increasing the height of the columns is working perfectly steady on your wire rope system. During a great gale on Oct. 2nd the holder was at its greatest height (120 ft.) and I can safely say it was the steadiest holder on the works. The wind pressure on that occasion was 24 lbs. per square foot as registered at Bidston Observatory Birkenhead. In fact throughout the whole of October we experienced exceptionally heavy weather and of course the holder during that time was tested in all positions but with the same unvarying steadiness. Wherever a maximum storage is required at a minimum cost your system can give it." Signed T.O. Paterson, Engineer

THESE HOLDERS ARE CONSPICUOUS FOR STEADY AND LEVEL WORKING UNDER ALL CONDITIONS. THEY WORK WITH MUCH LESS FRICTION AND IRREGULARITY IN A GALE OF WIND THAN GASHOLDERS WITH COLUMNS, AND ARE ALWAYS STEADY.

ASHMORE BENSON PEASE & Co Ld.
GAS WORKS CONTRACTORS
STOCKTON-ON-TEES

LATEST
Improvements in Sulphate of Ammonia Apparatus
(COLSON'S PATENT)

EXTRACT FROM ENGINEER'S REPORT—

"I can now obtain 60 Tons of Sulphate of Ammonia per week with 'Colson's' Still, using ONE Boiler, whereas, with my former continuous plant, TWO Boilers were required to produce 40 Tons per week."

For Prices and Particulars, apply to the Sole Makers—

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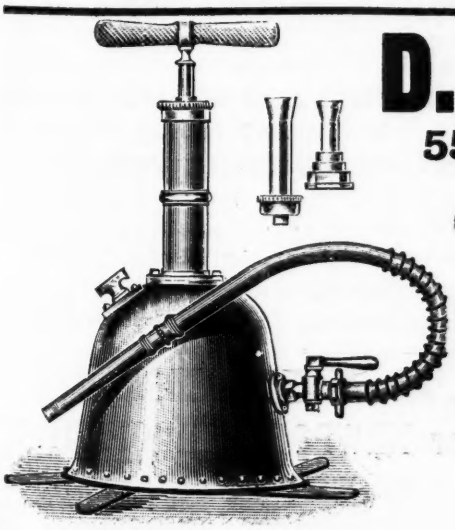

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LAMP TORCHES.

DRY GAS-METER MAKERS.

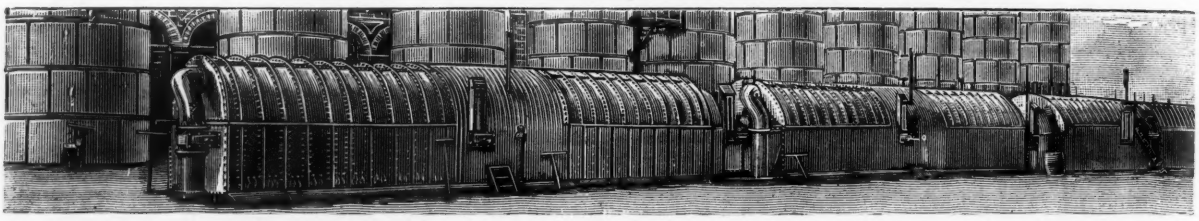
WROUGHT-IRON TUBES & FITTINGS.
STREET LAMPS & POSTS.

PRICE LISTS ON APPLICATION.

KIRKHAM, HULETT, & CHANDLER, LD.

PATENT "STANDARD" WASHER-SCRUBBER

☞ **504** of these Machines (capable of dealing with **491,150,000** cubic feet of Gas daily) in use and in course of construction, which fact is given as evidence of this apparatus being the Most Efficient of any in the Market for the extraction of Ammonia, Carbonic Acid, and Sulphuretted Hydrogen from Coal Gas.



View of SIX PATENT "STANDARD" WASHER-SCRUBBERS, erected at the Beckton Station of The Gaslight and Coke Company (the Engines driving same being under Galvanized Iron Covers). This Company have 30 of these Machines in use. They are also in operation at a great number of Gas and other Works in this Country and Abroad.

MARSHALL'S PATENT BATTERY CONDENSER & SCRUBBER.

This apparatus being made in sections, the capacity can be easily and cheaply made proportionate to increased make of Gas. Other advantages are: Large and effective cooling area, on small ground space, slow speed, no repairs required, high strength liquor obtained, &c. Six of these Condensers now in course of construction and erection.

MARSHALL'S PATENT TAR-EXTRACTOR.

Extracts practically all the Tar without choking up, and gives minimum back-pressure.

These Machines are in use at Ilford, Antwerp, Copenhagen, &c.

3 & 4, Palace Chambers, Bridge Street, Westminster, S.W.

GASHOLDERS

OF ALL SIZES.

The largest Gasholder of The Gaslight and Coke Company, at Beckton, containing 8 Million Cubic Feet, was made by us.

PLANED PURIFIERS OF ANY SIZE.

PURIFYING-MACHINES FOR REMOVING AMMONIA.

CARBONIC ACID & TAR EXTRACTING WASHERS. SCRUBBERS.

Sulphate of Ammonia Plant.

CLAUS' PATENT SULPHUR-RECOVERY PLANT.

SELF-SEALING RETORT-MOUTHPIECES. LIFTING APPARATUS. CENTRE AND FOUR-WAY VALVES.

SOLE MAKERS OF WECK'S PATENT CENTRE-VALVE.

TAR-DISTILLING PLANT. CONDENSERS. SLIDE-VALVES. WOOD SIEVES.
TAR-BURNERS. ROOFS. GIRDERS, &c., &c.

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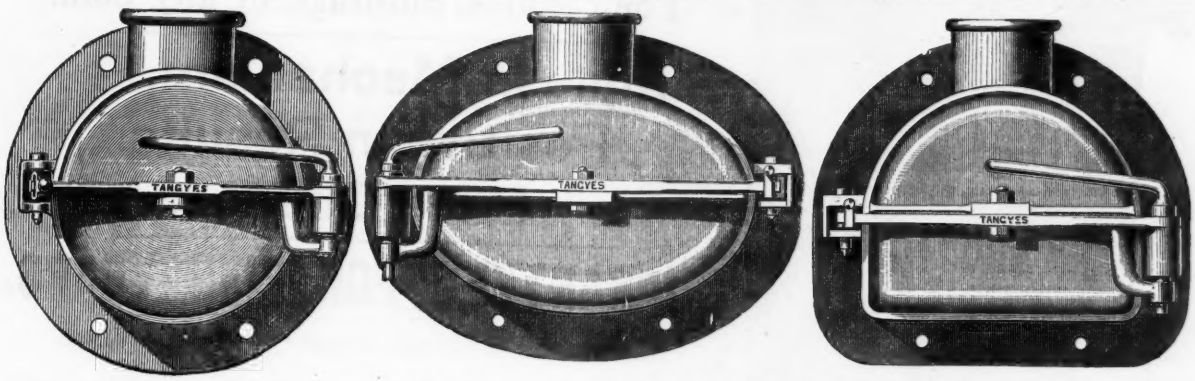

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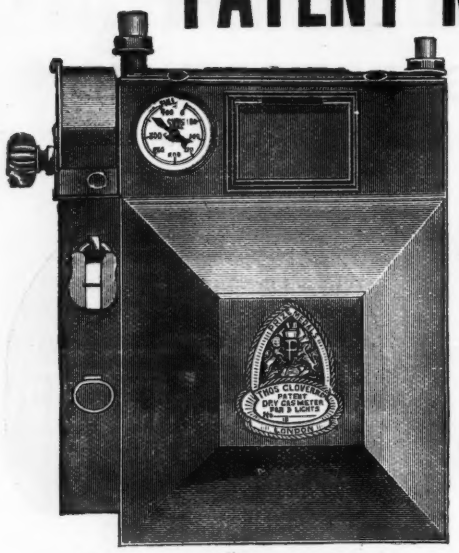

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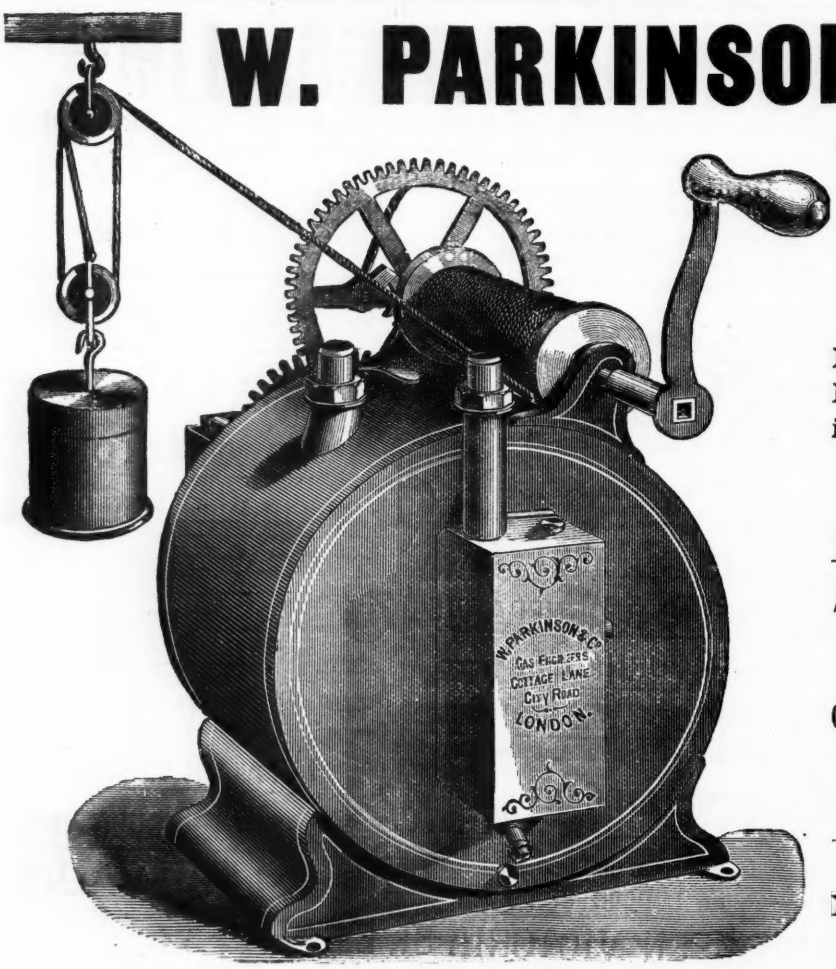

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TO CORRESPONDENTS.

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EDITORIAL NOTES.

The London County Council and the South Metropolitan Bill.

THAT the London County Council would decide to oppose the South Metropolitan Gas Bill was only what might have been expected. The subject came before the Council on Tuesday last, upon the report of the Parliamentary Committee. It appeared from this that the somewhat unusual, but very sensible, course had been followed of having the Chairman of the Company, Mr. George Livesey, to discuss the proposals of the Bill with the Committee. This was the more reasonable, inasmuch as the opposition of the Council to the Company's Bill of last year was based not only upon an altogether mistaken view of the aims of the promoters, and erroneous conclusions as to the effect of the measure if passed, but also upon extraneous considerations arising out of the Metropolitan Water Question. Notwithstanding Mr. Livesey's explanations, the Committee, by a small majority, decided to recommend the Council to present a petition against the present Bill, apparently because the same course was followed with the previous one. When the report of the Committee came up for discussion in the Council, the recommendation to oppose was condemned by Mr. R. M. Beachcroft, who declared that the Bill was in the interest of both the consumers and the employees, and that, instead of trying to defeat, the Council ought to support it. It also transpired that the Comptroller has reported that the probable effect of the passing of the Bill would be to increase the market value of the Company's stock by something like £450,000, which statement, if true, would be enough to ensure the opposition of the Council on the general principle. One would like to know how this astounding appraisal was arrived at. It seems that Mr. Livesey reckons that the saleable value of the Company's stock might be increased by the passing of the Bill by something like £91,000; and it is not so difficult to accept this figure as at any rate representing not unreasonably the improvement in market value which consolidation and unification would certainly effect in the stock in question. The point, as Mr. Beachcroft observed, is not one that particularly concerns the Council; but yet the Chairman of the Parliamentary Committee is considerably exercised over it. He believes the Company will stand in a much more favourable position if their capital stock is converted on a 4 per cent. basis. But why the Company should be prevented from attaining this advantageous position, whatever it is, this suspicious councillor does not say.

As a matter of course, Mr. John Burns and his following in the Council mean to oppose the Bill "tooth and nail." They refuse to see anything in the workman-director proposal of the Bill but an astutely-conceived attempt to "nobble" somebody or other. Not that Mr. Burns's opposition to the Bill is due to rancour against Mr. Livesey for having beaten the Battersea demagogue on a certain memorable occasion. Not a bit of it! All that Mr. Burns is now concerned for is to see to it that the County Council are not made a party to the suggested financial operation which is to have the effect of enhancing the value of the Company's shares "preferentially to the "Company and prejudicially to the consuming public." This prospect, he declares, is "quite enough for him;" and it would be quite enough to persuade Parliament to reject the Bill, if the facts were as they are thus stated. Mr. Burns and another member of the Council—a Mr. Thornton—did nevertheless say something unfriendly to the workman-director scheme. But neither of these critics succeeded in throwing fresh light upon the subject. Mr. Burns professes to see in the proposal "only another "form of the ingenious political pandering and economical "corruption to which the working classes are being sub-"jected." These be mouth-filling words; but what are they supposed to mean? There is here only another example of a "tale of little meaning, though the words "be strong," such as the world is unhappily accustomed to hear from this quarter. With all their pretence of "pro-"gressiveness," the Burnses of to-day stand on industrial questions exactly where they did when they used to talk of organizing universal strikes; and they cannot bring themselves to understand that the world has moved on and left them as powerless to alter the course of events for evil as they ever were to shape it for good.

The Meeting of the Manchester District Institution.

THE Manchester District Institution of Gas Engineers held their annual meeting on Saturday, when Mr. Isaac Carr, of Widnes, took the chair, and delivered the Inaugural Address which we reproduce in another column. This composition contains a good deal of interesting matter, not the least noteworthy being the passage in which Mr. Carr maintains the advantages of his modification of the Dinsmore process. The policy of appropriating gas profits to assist the rates is mentioned by Mr. Carr, only to be condemned as "suicidal." It is to be feared, however, that not much advantage is to be gained by the course suggested by the President—of the matter being dealt with in some unexplained fashion by the Institution. It is not the members of the Institution, but their employers, who decide upon what principles a municipal gas undertaking should be run; and though there is no harm in a presidential utterance on the subject by a gas manager so favourably situated in this regard as Mr. Carr, few of his supporters in the Institution would feel equally at liberty to speak heir mind about it. Individually, of course, every gas manager covets the distinction of selling cheap gas, and hates to see his works made into a milch-cow for the benefit of the municipality. It must be allowed that Mr. Carr has made out a strong case for fair play to the gas consumer; using the fresh material supplied by municipal adventure into electric lighting. Mr. Carr told the tale of his success with coin-controlled gas-meters. He appears to find the system just remunerative with an average annual consumption of 8500 cubic feet per meter, which is low, and speaks well for the "small and early" social habits of the Widnes cottage population. The great success of the innovation in Widnes consists in the large number of applications, which must be in an unprecedented ratio to the number of available houses. The members of the Institution paid a visit during the day to the Bradford Road station of the Manchester Corporation Gas Committee, and they also had the advantage of hearing a further communication from Mr. S. R. Ogden on the Blackburn carburetted water-gas plant; so that the day was well occupied.

Gas Affairs in Dublin.

THE state of tension that exists in the relations of the Dublin Corporation with the Alliance and Dublin Consumers' Gas Company will not be relieved by recent developments of this hopeless, weary scandal. The onslaught on the Company projected in the Corporation Bill has been mentioned in these columns; and so our readers are in possession of information respecting this and other manifestations of the spirit actuating the Corporation in their dealings with the Company, sufficient to enable them to appreciate the manner in which the proprietors of the Company would fare if the Corporation could have their way. In the midst of all this, the remarkable course was taken of inviting the Directors of the Company to a special meeting of the Council, so that the gas clauses of the pending Bill might be discussed with a view to arriving at an amicable settlement of the various points in dispute! This cool proceeding was worthy of the ingenious individuals who are at the bottom of the whole of the gas trouble of Dublin. Its object was obviously that of putting the Directors in the wrong in the eye of the public, and enabling the Corporation to claim magnanimity for offering to submit their legislative proposals to friendly discussion. Of course, the Directors perceived the trap thus artlessly spread in their sight; and, instead of attending the meeting, they sent the Lord Mayor a letter which effectually exposed the trick, and at the same time informed the public just how matters stand as between the Company and the Corporation. Among other little amenities, there is a still unsatisfied judgment of the Court of Chancery in respect of the street-lamp meters; and while speakers in the Council meetings, including the Lord Mayor himself, continually indulge in accusations against the Company of fraud upon the public, they are careful not to bring their various complaints to the issue of a rial. In such circumstances, it would be a mockery for the Directors to meet the Corporation in the manner suggested by the latter. The only dignified course for the Directors to take is that which they announce in their letter as their intent—to let Parliament deal with the proposals to which the Corporation, by their own motion, stand committed. Will the ratepayers of Dublin never rouse themselves to ascertain who it is that profits by the insensate conduct of the Corporation, and what is the real object of this interminable Bill promoting and litigation? Parliament will not permit the Corporation to rob the Gas Company. But it is for the ratepayers to organize for their own protection.

The Insurance of Gas Undertakings.

A GOOD subject for a District Gas Association paper would be some recent developments of insurance in respect of the operations of gas undertakings. This matter has never been brought before a gas engineers' society; and the importance of the connection that various insurance offices have succeeded in establishing with Gas Companies is such that a good discussion of the whole subject could not fail to be both interesting and profitable. At the same time, the question of self-insurance by gas undertakings having accumulated funds for the purpose, could be treated in a more systematic manner than anything that has yet been attempted in this regard. Reserve funds and undivided profit balances are in some respects insurance funds; but it would be to advantage to have their limitations in this respect defined, and the benefits of regular insurance set out in the light of recent experience. Many gas undertakings have neither reserve nor insurance funds; and it is to these that the facilities offered by the offices particularly appeal. It is well known that a good deal of business in this way has been secured by offices that have specially laid themselves out for it. But it is probable that many gas managers hardly know what lines to go upon in their dealings with the enterprising and persistent class of insurance agents. The electric lighting interest has been greatly exercised of late over the large increase in the rate asked by the fire offices for the insurance of central stations, which are now treated as hazardous risks. Electricians feel the pinch of this claim very sorely, because it so flatly contradicts their favourite claim for the harmlessness of electric currents. They would be still more disgusted if they knew how cheaply, as a rule, gas-works insurance is "done." Fire insurance, however, is but one department of the business; and many gas undertakings are protected from loss in regard to a wide range of possibilities both within and outside their works. Without saying more on the subject now, we venture to hope that some gas engineer who has been constrained to look into the subject on his own behalf, will put his stock of information and his observations into a form suitable for public discussion. There is a great deal in the principle of insurance; and the extent to which applications of it have been made in recent years would be astonishing to not a few, if it were known. Law and practice have greatly enlarged the scope of Gas Companies' liabilities to the public during the past few years; and while it is of the first importance to the interest of the gas industry that public confidence should not be shaken by any reluctance of gas supply undertakers to bear the consequences of their own forward policy, it is expedient that the means adopted for underwriting these liabilities should be soundly advised.

The Responsibility of Directors.

DURING the last few weeks, or months, there have occurred such a number and variety of scandals about company directors, that it is somewhat strange there has not been any general discussion in the newspapers upon the system of board management of joint-stock concerns. To say nothing about the Liberator affair and its branches, instances have occurred exhibiting the "guinea-pig" in all his crudity, and the very capable professional director in his plurality and self-seeking. It cannot be said with truth that the pictures exhibited in the daily law reports of the manners and customs of casually-selected specimens of the *genus* director have tended to increase one's respect for the class. Better the worst that can be urged theoretically against the much-criticized workman-director, than the best that some of Her Majesty's Judges have felt constrained to say of individuals who still pose before their contemporaries as representative "City men." There seems to be as much danger, to the interests committed to their charge, in directors knowing too much, as in their utter ignorance of business. One cannot help thinking, after reading some of these scandalous reports, that the joint-stock system of trading needs thorough overhauling, not only as regards the law, but also in respect of the ethics of the system. The principle of limited liability in capital has been extended to apply to the moral responsibility and intellectual service of members of

boards of directors. Men will do as directors things which they would be ashamed to do in their strictly individual capacity. They will suffer business to be carried on, ostensibly by their authority, in so unbusinesslike a way that, as the Italian proverb has it, the very chickens laugh thereat. And it appears impossible to make these sufferers from the insidious directorial taint perceive how wrong, or stupid, or unworthy are those acts, or the policy, for which they recognize only a fractional responsibility, if any. Now and then, circumstances over which these gentry have no control bring them within the purview of the Courts; and then they are apt to hear something not at all to their advantage, or to the credit of the system which has made them what they are. Commenting upon some observations of the Lord Chief Justice on the duties of a director in a recent case, *The Times* remarked that "the "man who takes on himself so responsible an office is "bound to do his best for the interests entrusted to his "care. To receive his fees and to do nothing for them "is blameworthy enough. . . . A directorship is too "often assumed either with no sense of responsibility, "or with a sense so imperfect as not to be proof against "the temptations the office offers. Commercial morality "is in frequent need of some such stimulus as it occasion-"ally receives in the Law Courts. There are offenders in "many degrees, from such downright rogues as Jabez "Balfour and his confederates, to the easy-going City man "who treats his directorship as a sinecure, or to the man "of title who allows his name to be used for the benefit of "a company of which he knows little or nothing."

The truth of the matter is that shareholders are perforce largely ignorant, and too often utterly heedless, of the personalities of those to whom they entrust the care of their property and the procuring of those dividends which they frequently treat as the be-all and end-all of their interest. Even where the qualifications of a director are required to be something more than the possession of a title, and a position of some sort, how are shareholders to distinguish the directors who really deserve their confidence, from those to whom the conventional vote of thanks is a satirical compliment? They go by a man's name, and by what they know of his reputation and connections. But he may be completely destitute of interest in their affairs, and they would be never the wiser. A man is elected a member of a Board for a variety of reasons; but his own most potent reason for seeking the office is desire for the fees. There is no harm in this desire, if it is attended by an honest belief in one's capacity to earn the recompense by doing the work, and taking the moral as well as the legal responsibility of a director. Supposing a person of the directorial class to find himself upon a Board where he can do little or nothing, where things are done of which he does not approve, and where the real administration is in the hands of those who are willing enough to let him take his fees so long as he does not interfere with them. What is such a director to do? If his sense of responsibility were not limited, just as is his financial liability, he would act in such circumstances very differently from the way in which, as things are, he usually does act. As it is, he takes his fees; and when the policy of the Board is criticized in his hearing, his sense of limited liability always draws the line of responsibility between himself and the condemnation of the censors of the Board.

WATER AND SANITARY AFFAIRS.

In the County Council debate on the Welsh water scheme last week, a statement was made by Mr. Westacott, one part of which is rather difficult to understand. It was stated that the two leading parties in the Council had agreed on two important matters affecting the water supply —that is to say, they had decided to oppose the Water Companies' Bills, and "to proceed with the County "Council Bills." These latter are, of course, the Transfer or Purchase Bills. The two parties may agree for the purpose signified; but in that case we are surprised that they have not taken steps to revoke the decision of the 15th of October last, when an amendment by Mr. Stuart, that the Council should proceed with the Purchase Bills, was negatived. This decision was recognized at the next meeting of the Council, when Dr. Collins moved a further amendment, declaring—"That, the Council having de-"cided not to proceed with the suspended Water Bills, "the Parliamentary Committee should be called upon to "report the lines on which they would suggest that the "Government should be asked to legislate." In due course, the Parliamentary Committee so reported. They recommended that Her Majesty's Government should be invited to constitute by an Act of Parliament a public authority for the entire water area, and that in the meantime the Council should open negotiations with the Water Companies for the purchase of their undertakings. When this report came before the Council, an amendment was adopted that the Government should be asked whether they would promote or assist legislation separating the water supply of the outer areas from the Administrative County of London, and giving the control of the central supply to the Council and the Corporation. It will be remembered that when this resolution reached Lord Salisbury, his Lordship returned a guarded reply, committing the Government to nothing, and leaving the question where it was. After all this, we find the County Council falling back on their own purchase scheme, and pushing their Bills in Parliament. We confess we do not understand such a procedure, though we presume there is some technical way of justifying it.

A report which comes up from the Joint Parliamentary and Water Committee to-day declares that six of the Council's Water Bills have been "kept alive" by a resolution passed on the 18th of February, by which it was agreed that notice should be given of their second reading, but that the House of Commons should be asked to consent to a postponement of that stage. The present report of the Joint Committee also asserts that the Council "retain "full control over the Bills;" and it is recommended that the members having charge of these six Transfer Bills shall be "authorized" to move the second reading, but it will be a matter of "discretion" as to whether or not this shall be done. Concerning the Transfer Bills relative to the Southwark and Vauxhall and the Lambeth Companies, the reference to a Select Committee remains "deferred." To our judgment, it appears that, whatever "compromise" may exist between the Progressives and the Moderates concerning the whole of the Transfer Bills, there is a want of regularity in the proceedings of the Council, and something like a change of front on the part of the Moderates.

The utter improbability of the Transfer Bills having the slightest chance of passing the present House of Commons, renders the situation all the more absurd. Yet we find Mr. Stuart last week bringing forward a motion in Parliament to commit the Lambeth and the Southwark and Vauxhall Transfer Bills to a Hybrid Committee. There was an objection to this; and the motion stood over. The six other Transfer Bills are down for second reading on the 13th—just a week next Friday. On that day it is expected that the Government will declare their intentions. But the Kent Water Board Bill is to be brought up on Monday next. Of course, it may stand over; and so may the Bills which are entered for the 13th. It is a little amusing to see how the County Council deal with the proposal for creating a Kent Water Board. They like the idea, because it cuts off a portion of the outer area. But they are particular about the financial arrangements, and as to the quantity of water which is to be available for London. The Kent Bill is therefore to be opposed, but not "seriously." All depends on the arrangements; and the Council petition against the Bill with a view to enforce certain terms. In the midst of all this tangle, the County Council have agreed, after considerable talk, to postpone further consideration of the Welsh scheme until this day fortnight, by which time they expect to know what the Government propose to do. It would also be interesting to the people of London to know what progress Sir Arthur Arnold is making in his negotiations with the Water Companies for the purchase of their undertakings. Perhaps that part of the business also stands over until after the Government disclose their plans. Dr. White reckons that it will cost thirty millions to acquire the undertakings of the Water Companies—a sum which will have to be added to the thirty-eight millions wanted by Mr. Binnie.

There is some danger of forgetting that Mr. Binnie's estimate for the Welsh supply only covers a period of fifty or sixty years, at the end of which time more money will have to be spent in order to keep pace with a growing

demand. Mr. Idris last Tuesday indulged in large expectations concerning the Welsh supply, declaring it would be equal to the increasing requirements of the population for two hundred years to come. But this will not be done for thirty-eight millions. Mr. Stuart was good enough to say that the question was not one of substituting Welsh water for water obtained in London, but of "augmenting" the existing supply. The change, therefore, is not to be substitutional, but supplemental; and Mr. Stuart holds to the notion that the supply from the Thames and the Lea has now "practically reached its limit." The Royal Commissioners did not think so, though Mr. Stuart tries to make out that they did. Their conclusion really was that the Thames, the Lea, and the chalk wells could be so drawn upon as to furnish a sufficient supply to London and the outer areas for the next forty years, even supposing the population went on increasing at the same rapid rate as in 1881-91. Lord Tweedmouth has just declared that to find "other sources" from which to draw water for London is "the quickest way of coming to terms with the Com-"panies." The Council cheered the remark. But we would suggest that "the quickest way" of coming to terms with the House of Commons would be the more discreet consideration for the Council. It may be that the chance has passed away, and the Council may proceed to roll up their map of the Welsh project, saving the ratepayers the further outlay of £10,000 in completing the details of that unnecessary scheme.

PERSONAL.

Mr. HAROLD D. MANN, at present the Assistant-Manager of the Colne Gas-Works, has been appointed, out of 74 candidates, to a similar position at the Scarborough Gas-Works.

The shareholders of the South Staffordshire Water Company have voted a sum of 500 guineas out of the profits of the past half year, for a presentation to Mr. FRANK JAMES, the Chairman, in recognition of his long services to the Company.

Dr. LUDWIG MOND, F.R.S., who is known to many of our readers in connection with his process for the recovery of sulphur from alkali waste, is to be President of the Chemical Science Section of the British Association at the meeting this year in Liverpool.

Another long record of presidency over a gas undertaking was mentioned at the annual meeting of the South Shields Gas Company last Friday, when Mr. ROBERT WALLIS, J.P., the Chairman, expressed his pride and pleasure in occupying his position for the sixty-first time.

Sir I. LOWTHIAN BELL, Bart, F.R.S., was presented by the Prince of Wales last Wednesday, at Marlborough House, with the Albert Medal of the Society of Arts, awarded to him by the President and Council "in recognition of the services he has rendered to arts, manufactures, and commerce by his metallurgical researches and the resulting development of the iron and steel industries."

Calculating the Thermic Power of Coal.—In the "Bulletin de la Société Chimique de Paris," M. Arth gives the analysis of seven varieties of coal with their calorific power, as calculated by Dulong's formula, and as shown by experiment. The greatest difference between the values is 1·85 per cent. of the value determined.

Reduction in the Price of Incandescent Gas-Lights.—The Incandescent Gas-Light Company, Limited, have made a further reduction in the price of their lights; the charge for the ordinary "C" burner being lowered from 9s. to 6s. 6d., and the other patterns in proportion. This concession is consequent upon the great development of the Company's business, which enables the burners to be produced at a cheaper rate than hitherto; and is granted with the view of further popularizing the system of incandescent gas lighting. While supplying the burners at a cheaper rate, their present quality will be fully maintained.

Abandonment of the Proposed Light and Heat Exhibition at Woodhouse Park.—Our readers may remember that, owing to the stoppage of work caused by the intense frost of last year, the buildings intended for the above-named exhibition could not be completed, so as to allow the opening to take place, as originally intended, in May, 1895. It was therefore decided to defer the exhibition for a year. Last summer, however, the General Manager (Mr. J. Furley) unexpectedly received notice from the Solicitors of the Central London Railway Company that they would require Woodhouse Park for the purposes of the railway. Thereupon the Committee of the Exhibition gave Mr. Furley full power to negotiate on their behalf with the representatives of the Company. An offer has now been made which he has thought it right to accept; and under these circumstances, the exhibition will not be held.

ESSAYS, COMMENTARIES, AND REVIEWS.

GAS AND WATER COMPANIES IN THE STOCK MARKET.

(For Stock and Share List, see p. 477.)

BUSINESS last week on the Stock Exchange was fairly active, despite some occasional lapses into quietude for a while; and, on the whole, prices effected an improvement. The greatest activity and the greatest strength were displayed by the gilt-edged class, which was in brisk demand. Consols on Friday again touched 110; and a conspicuous feature was the advance in Corporation stocks. A slight check was administered on Saturday by the news regarding the United States and Cuba; but it did not promise to be formidable. The more speculative departments were quieter. Money was wanted for requirements in connection with the settlement; but the demand was readily answered. In the Gas Market, business was a shade more active than it had been in the preceding week; and the continuous demand for everything with a good character was strongly maintained. A large number of the quoted issues advanced their prices, some of them to a considerable extent, while none receded. Gaslight "A" was again active; and the price gradually hardened until on Thursday the stock changed hands at 309, but the quotation was not varied. There was not much doing in the secured issues; and the figures remained unchanged. South Metropolitans again displayed great strength; and all four issues went up in value considerably. Nothing at all was marked in Commercials; and it seemed as if stock was very scarce. Hardly any business was done in the Suburban and Provincial division; there being no sellers to speak of. Many of them rose in value freely; and conspicuous among these were Brentford, Bristol, British, Croydon, and Crystal Palace. The Continental Companies also were well to the front in the general advance; and good improvement was made by Union, European, and Imperial. The favourable tendency extended to distant parts, and was shared by the undertakings located in India, Australia, and South America. The great increase which has lately taken place in the volume of business done in the Water Companies showed no signs of falling off last week; rather the reverse. Large as are the advances recently effected in the quotations of all the Companies, there was still room for greater improvement; and most of them rose in price materially.

The daily operations were: Business in Gas was rather quiet on the opening day; but prices were very good. South Metropolitan "A" rose 3; and ditto "B" and "C," 2. Southwark Water advanced 1½. Tuesday's volume of business was about the same. Continental Union and Belgrano debenture improved 3; Buenos Ayres, ½; and ditto debenture, 1. In Water, Kent rose 2; and Lambeth, 1. The steady upward rise in Gas Stocks proceeded merrily on Wednesday. Continental Union, Imperial Continental, and South Metropolitan "A" and "C" went up 2; ditto "B," 1; and British, ½. In Water, Lambeth debenture and Southwark ordinary advanced 2; and ditto "D," 5. There was more doing on Thursday, and everything dealt in commanded good figures; but the only change in quotation was a rise of 2 in Continental Union. In Water, East London and Lambeth moved up 2. Friday was fairly lively, and full of strength. South Metropolitan "A" and debenture, and Crystal Palace rose 2; both Europeans, ½; and Bombay new, ¼. Southwark Water ordinary improved 2; and ditto "D," 2½. Saturday was as usual. Sydney and Melbourne 4½ per cent. bonds rose 1. Southwark ordinary gained 1 more.

ELECTRIC LIGHTING MEMORANDA.

The Good Fortune of Swansea—Unintentional Beneficence of a Tramway Company—Will Electric Lighting Pay in Swansea?—Considerations for the Swansea Ratepayers.

BY what must be characterized as an undeserved piece of good fortune, those who have advised the Corporation of Swansea to spend public money upon the so-called "triple scheme" of refuse destruction, electric lighting, and tramcar propulsion, have escaped from the fate that has for some weeks impended over them of being charged with carrying their plan into effect. This notable scheme has been criticized several times in this column, so that it is not necessary to explain it in detail again. The ratepayers of Swansea are to be congratulated on the collapse of the bubble, which was not brought about by the return of a lucid interval to their infatuated Municipality, but by a fortunate bit of obstinacy on the part of the local Tramway Company. Before this transpired, the Corporation had taken the requisite initial steps for promoting a Bill in Parliament to enable them to enter upon the El Dorado promised for their inheritance; but the incredulity of some ratepayers who could not see the golden prospect opened out for Swansea, of all places in the universe, by the electricians interested in the scheme, necessitated the taking of a poll. In the meantime, the Corporation endeavoured to strengthen their case by calling in Mr. W. H. Preece, who thought they could not do better than go on with their scheme. Curiously enough, a local newspaper has observed that, in consequence of Mr. Preece's expression of

approval of the scheme, "scarcely any opposition remained;" although how this could be known while the poll was not taken is a mystery. However, what the ratepayers really thought of the project to spend their money in this way will never be known, because the Bill is dropped, and the poll is no longer necessary.

It appears that the Tramway Company, who were to be the principal customers of the proposed electric power generating and refuse cremating establishment, "jibbed" at the last moment, and refused to be bound to support the scheme in the manner desired by the Corporation. The precise grounds of disagreement between the Company and the Corporation have not been made public. All that is known about the matter is that the Company flatly rejected an ultimatum sent to them by the Corporation; and this refusal entailed the withdrawal of the Bill. It may be questioned if anybody will be sorry for this. It is stated that the Corporation's electric lighting *cum* dust-destruction scheme still stands; but it would perhaps be a more correct statement of its condition if the two last words of the sentence were transposed. The local press asserts that the Corporation before proceeding with it will be willing to see how the ratepayers regard the question—a very prudent course, which it is to be hoped will be followed. Whether they happen to have a Provisional Order for electric lighting or not, a municipal body are not morally justified in committing their constituents to such a serious undertaking as an electric lighting scheme without receiving an expression of public opinion in its favour. It is fairer to all interests that this should be done in every instance; and unless we are much mistaken, there are several English Corporations that did not take this precaution who now sorely regret their temerity in embarking unsupported upon a speculative venture.

We notice that a Swansea paper asks the question whether electric light can be supplied in the town at a profit, without the supposititious help the Tramway Company were to have rendered; and the writer remarks in this connection that "the great majority of the business premises, as well as the private houses of Swansea are held upon an annual tenancy only, so that a difficulty would at once arise as to the payment of the cost of fittings, &c." If this observation means anything at all, it signifies that, in the writer's opinion, such a venture would not prove a great success. Yet he goes on to state that, unless the Corporation make some use of their fast-expiring Provisional Order, "a private company will be allowed to step in, and thus the town will have to suffer from the creation of another monopoly." It does not seem to have struck this breather of hot and cold that such a company would have to face exactly the same discouragement as he foresees for the Corporation. Would it be possible to float a company in South Wales for the purpose of introducing electric lighting into Swansea in the event of the Corporation declining to go on with their scheme, or what remains of it? This is the true test of the matter. Meanwhile, can the experience of Cardiff throw any light upon the prospects of Swansea in this regard? This fear of the creation of another "monopoly" is merely a bogey, adroitly used by electricians in search of a job, to frighten local authorities into doing what they very well know no private investor would think of attempting.

We have discussed the case of Swansea, at some length, in order that those ratepayers and others who do not think the Corporation justified in promoting the electric lighting scheme may see how the whole affair strikes an outsider. If, as recently in the case of Wimbledon, full public discussion of the project results in a verdict that its expediency is "not proven," the Corporation will have reason to be thankful for being saved from committing an administrative blunder of the first magnitude. We do not presume to say whether Swansea does or does not want a public electric light station paid for and maintained out of the rates; but it is quite certain that the ratepayers ought to be directly consulted on the question. If Swansea is prepared to tax itself for such a purpose, that is its own affair. We do say, moreover, that into the question of whether Swansea or any other place wants a public electric light station, and wants it so generally as to make the working of such an establishment pay, the possibility of saving generating expenses by the aid of rubbish destruction does not enter as a legitimate element. No central electric lighting station that could not pay independently of the supposed help of rubbish fuel can pay simply and solely by virtue of this assistance. This is no fancy of ours, inspired, as of course all our editorial opinions are supposed to be inspired, by jealousy of a rival means of lighting. The subject of the imaginary advantages of rubbish destruction as an aid to electric lighting has often been discussed in these columns, and need not be reopened until evidence is forthcoming (from Shoreditch or elsewhere) of the actual results of experience of what has hitherto been more talked about than seen. We should have no reason to begrudge to the Corporation of Swansea or any other town the happiness of lighting their streets and driving their tramcars by electricity derived from the energy at present thrown away in their refuse; and we are glad that the experiment is actually in the way of being tried. It is practical wisdom, however, to abstain from copying an experiment until after its outcome is known, especially when it is a costly one to make, and cannot, in any event, make much difference to anybody. What the public of a locality invited to adopt electric lighting on the assurance that rubbish destruction is competent to remove the risk of financial failure have to remember, is that volume of business, not internal economies, is the first and last consideration in determining the financial issue always, and especially where, as in the case of electric lighting, the price of the supply is adjustable at will.

ENGINEERING CHEMISTRY.*

This new volume of Griffin's Scientific Text-Books is to be welcomed. It is the first of a couple which are to be devoted to setting forth the chemistry of engineering and manufactures—an ambitious programme, as to which the eminence of the authors (one of whom is the head of the Chemistry Department of the Goldsmiths' Institute, New Cross) encourages the hope of a satisfactory fulfilment. It is, indeed, in its relation to engineering and manufacturing industry that chemical science assumes its chief commercial importance. In regard to these applications, chemistry can justly claim to be the science of first principles and ultimate reasons. The engineer designs and constructs, and the manufacturer makes products; but it is the chemist who must be relied upon to inform both as to what it is they are handling, and the why and wherefore of their treatment of their materials. Hence there can never be too much of the particular kind of chemical information which Messrs. Blount and Bloxam have set themselves to give to the world. The complaint is more likely to be that there is not nearly enough known concerning the true nature of materials, processes, and products for them or anybody else to tell.

Towards engineering and manufacturing industry, the attitude of chemical science is mainly critical and suggestive. The authors of the book before us recognize this, and state in their preface that it has not been their intention to exhaustively describe plant and processes which differ from one another merely in detail; but they have proposed to themselves to deal only with types. This wisely-chosen plan has given the opportunity for presenting the subjects dealt with in a manner which shows their relations to each other; and consequently the authors permit themselves to hope that their work as a whole may prove useful even to experts. "In order to achieve this degree of usefulness, the authors have specially endeavoured to explain the general principles underlying each process, even when the working details appear complex and arbitrary"—that is to say, they accept the critical attitude already referred to. We have now to see how they justify themselves in assuming this responsibility.

The book is divided into two parts, whereof only the first—which treats of materials of construction and sources of energy—concerns us. The second part is metallurgical. We like the direct, forcible style in which the first chapter, on the chemistry of the chief materials of construction, plunges right into the heart of the subject. Writers of text-books are permitted to be dogmatic. It saves explanation, and also engages their readers' respectful attention. These authors write upon the chemical nature of building stones, bricks, and cements in a manner that, for clearness, pointed expression, and avoidance of redundancies, cannot be too highly commended. They remark of bricks that they "may be regarded as blocks of artificial sandstone, with more cementing material than that which is present in the natural varieties"—a luminous definition. All the same, when they come to describe and discuss bricks in detail, they fall into the besetting sin of chemists, of overlooking or belittling the effects of different ways of treating the materials the essential nature of which they know, or think they know, all about. Thus early in the book is illustrated unconsciously by the writers the chief reason why engineers and manufacturers employ, rather than are employed by, chemists. It is because engineers and manufacturers take a wider view of whatever material or product they have to do with than, as a general rule, does the chemist. In the present case, the chemists say of bricks in the general what is perfectly true and comprehensive. When they come to particular kinds of bricks, they say that many such are known by name, but "cannot be considered individually." Perhaps not, from their point of view; but it is precisely this "individual" knowledge that the buyer and user of bricks requires to have. The authors express a decided preference for kiln-burnt bricks, on the ground of their being more uniformly burnt and more generally reliable than clamp bricks; but this *dictum* by no means exhausts the case on either side. There is something in the self-burnt stock brick which, as engineers are well aware, the kiln cannot produce; and the very irregularities and the roughnesses of such bricks, which are blemishes for some purposes, are merits for others.

The observations of the authors upon concrete and cement are sound. With respect to common mortar, it is stated that the admixture of about 5 per cent. of plaster of Paris is claimed to be beneficial; but nothing is said on a point that might be supposed to call for chemical investigation—the effect of adding saccharine matter to lime mortar. The troublesome efflorescence that sometimes disfigures and injures brickwork is duly considered.

* "Chemistry for Engineers and Manufacturers. A Practical Text-Book." By Bertram Blount and A. G. Bloxam. With Illustrations. Vol. I.—Chemistry of Engineering, Building, and Metallurgy. London: Charles Griffin and Co., Limited, 1896.

The treatment accorded to fuel is comprehensive and exact. The definition of "fuel," by the way, is "any substance capable of exothermic oxidation with sufficient rapidity to leave an available balance of energy after the leakages of energy surrounding the point of combustion (*e.g.*, radiation, convection, and conduction) have been supplied." We are not altogether pleased with this definition. It is easy to see what the authors are striving after; but we doubt if they have succeeded in their attempt. "Chambers" defines fuel as "anything that feeds a *fire;*" and this interpretation seems good enough for anybody. How can such "leakages" as radiation, convection, and conduction be so styled, unless by this term is meant only so much of these infinite effects of combustion as can go on without the fire going out? However, to pass on to other matters. The authors describe the different kinds of coal and the two classes of coke in a series of broad generalizations which admirably express the chief points of distinction, and connect these with the purposes for which the different classes of fuel are intended to be used.

The treatment of the subject of gaseous fuel is particularly good. The authors are careful to explain that there can be no possible gain of energy, but contrariwise a loss, in gasifying solid fuel before burning it. Yet it often happens that, for various reasons, it is commercially and industrially advantageous to so treat solid fuel; and this fact men of science are now solicitous to admit, albeit the early chemical science of the subject darkened rather than helped to elucidate the mystery. The authors give five good reasons why firing with gaseous fuel can, for many purposes, be employed with advantages over solid fuels, to which a sixth might be added—the reduction of the intense heat created locally in the furnace when solid fuel is burnt completely to carbonic acid, and the substitution for it of a more diffused heating effect capable of being applied where it is wanted, which may be at a distance from the furnace itself.

The present volume does not specifically describe the production of coal gas, which is reserved for the second volume; but gives an account of the ways in which gas is burnt for the sake of generating heat. Comparing the luminous and bunsen gas-flames, the authors very properly observe that the total calorific effect is constant, however the gas is burnt, provided its combustion be complete. Choice between the methods turns, we are told, on their convenience under given conditions. This is true; but nevertheless the convenience of the bunsen flame ought not to be so implicitly accepted as is generally the case. The authors say "for rapid heating *in contact with the flame—e.g.*, boiling—the non-luminous flame is necessary, as it does not deposit soot on the vessel heated, which would form a non-conducting layer"—and, it may be added, become a nuisance on account of the "dirt." The italics in this passage are ours—used to mark an essentially erroneous view of the conditions for "rapid heating." It ought to be known to the authors that in no circumstances, whether the object be speed of heating or anything else, should a flame of gaseous fuel be permitted to come into what is called contact with the article which it is intended to heat. As a matter of fact, this contact does not take place. The cold surface extinguishes the burning gas within a surrounding zone of very appreciable thickness; and the products that escape from this checked combustion, represent waste and give annoyance, whether the gas-flame is luminous or atmospheric. There is no real reason why the latter method of burning gas should be chosen for many of the purposes to which it is commonly applied; and the nuisance of the stench which it is easily capable of evolving, is far more objectionable than would be the small extra cost, if any, entailed by so using the luminous gas-flame for the same purposes as to avoid the deposition of soot. All that is required to this end, is to so regulate the luminous flames that their tips do not quite touch the surface to be heated. The authors may be recommended to look into this question for themselves.

The production of generator gas is described under the three heads of producer gas, made by the limited action of air alone upon fuel; water gas, made by the action of steam upon heated fuel; and semi-water gas, made by the action of both air and steam upon fuel. It is also pointed out that gases of the two latter types can be made by the action of carbonic acid gas, alone or mixed with air, upon fuel. This is a praiseworthy way of getting rid of the cramping effect due to the habit of calling a certain typical product by the name of a particular individual, who may have had something to do with discovering or popularizing a way of making it. It is only one of the many evidences given by the authors of their solicitude for going upon principles, for which they are deserving of the highest commendation. They also deserve praise for carrying out the promise of their preface, and concentrating their reader's attention upon types, without distracting him by a multiplicity of particulars. This is elementary teaching in the highest sense of the term. It cannot be said of this book that "one cannot see the wood for the trees," for every convenient point of 'vantage is seized upon for the purpose of giving the student a true perspective view of the subjects brought before him. Nor do the writers shrink from telling an uncomfortable truth, as when they say that smokeless firing, with smoky fuel, is less economical than allowing it to burn smokily. The futility of the last smoke abatement craze was a natural consequence of the blundering made on this point.

The discussion of water gas and its production is clearly worked out; and the same can be said of the treatment of the subjects of the chemistry of steam raising, and lubrication. Finally, this book is worthy of high rank in the class of literature to which it belongs. Its merit is great, and uniformly maintained. The printing and method of arranging the matter are excellent. The work is altogether a most creditable production; and we are glad to be able to warmly recommend it to all whom its contents may concern. We look forward with keen interest to the appearance of the second volume.

NOTES.

Cylindrical Coal-Stores.

The gasholder form of store for water is known to possess great attractions for water-works engineers in the United States; and now, to judge from a recent contract executed by the Berlin Iron Bridge Company, the same type of construction is to be extended to stores for coal. The requirement was to secure the maximum of storage capacity upon the smallest ground space; and this was satisfied by the erection of a cylindrical tank 28 feet in diameter and 54 feet high, which will contain 1000 tons of coal. This store, called in the American language a "pocket," is filled from the top by means of a self-tipping bucket worked by a hoisting engine; the whole mechanical equipment being of the simplest character. There is a hole in the side of the cylinder for discharging the contents into trucks; but it is not claimed that there are any facilities for handling the coal. It is, however, reputed to be an economical method of storing; and it is especially claimed that it takes up less room, proportionately to the storage capacity, than any other device. A bird's-eye view of a town well provided with gasholders, water-towers, and cylindrical coal-stores would give a fine illustration of the "stove-pipe" effect on the large scale.

A New Kind of Light.

An illustration of photography produced by the action of "etheric" light recently appeared in the "Electrical Review." It is a portrait of Mr. Moore, obtained by exposure to the light of an interrupted discharge in vacuum tubes. The principal novelty in this device consisted in the fact of the contact-breaker being situated *in vacuo*, so that there was what might be called an "ether" gap instead of the usual air gap to be crossed. When the arrangement was first noticed by our electrical contemporary, the idea was commended as extremely ingenious; but the doubt was expressed as to whether a light of practically useful intensity could, under any circumstances, be obtained from phosphorescence of a vacuum tube. By way of practical answer to this scepticism, Mr. Moore has sent his own photograph, taken by the "etheric" light of four vacuum tubes 9 ft. 6 in. long and $1\frac{1}{2}$ inches diameter, disposed round the walls of a room measuring 10 feet by 11 feet square. This result is considered as being considerably in advance of any other that has so far been obtained by experimentalists who have attempted to produce "light without heat."

The Distribution of Atmospheric Carbonic Acid.

The production and distribution of atmospheric carbonic acid have been discussed afresh with reference to the latest additions to the stock of knowledge of the subject. Professor Abbe remarks that of the small proportion of carbonic acid gas existing in the atmosphere, the leaves of plants absorb and assimilate a portion; the falling raindrops and the surface water of the ocean absorb another portion; and meanwhile the store in the atmosphere, is increased by the exhalations of every lung and the products of combustion of everything that burns. Carbonic acid may accumulate temporarily in some regions; but slow diffusion and the winds carry it off and scatter it. It ought to diminish as we ascend above the earth's surface. But the rapidly rising and falling air currents tend to preserve a fairly uniform mixture, just as they do in the case of aqueous vapour. Evidently, a general balance is maintained between the production and absorption of carbonic acid; so that, like the temperature of the air and the quantity of rain or any other meteorological element, it is not possible to detect any great progressive secular increase or diminution. There is at least no evidence that the increasing population and industrial activity on the surface of the earth is promoting conditions tending to universal asphyxiation.

The Direct Conversion of Heat into Electricity.

In the course of his official review of the science and industry of the past year, the Secretary of the Franklin Institute devotes a few remarks to the unsolved problem of the direct conversion of heat into electricity. It is stated that some progress seems to have been made in increasing the efficiency of the thermo-chemical pile. But the anticipations of those who had hoped for improvement in the direction of obtaining electricity directly from the combustion of coal have not been realized. The experiments of Börchers with a gas battery which apparently derived its electro-motive force from the oxidation of carbonic oxide, and thereby appeared to demonstrate the feasibility of attaining the object aimed at by indirect means, have been subjected to searching criticism; and the results, if not actually invalidated, have been rendered doubtful. The problem, though admitted upon theoretical grounds to be possible of

solution, yet remains as perplexing as ever. This problem has been recently discussed by Dr. Duncan, who says he is confident that a solution will be discovered. As for the method of solution, it must be remembered that the problem is that of the production of electricity from nothing but the consumption of fuel and air. This points to two methods. Either a gas battery must be used, or a substance must be discovered which will in some way convey the oxygen of the air to the carbon without being itself decomposed.

The Explosion of Coal Dust.

Further experiments on the explosive character of coal dust suspended in air have been carried out by a Committee of the North of England Mining Institute, who have been at work for nearly a year and have just presented a second report. It has been ascertained, contrary to what has been stated, that an exceedingly small quantity of coal dust in air is sufficient to cause an explosion; so that it is not impossible that many explosions which have up to the present been attributed to the ignition of inflammable gases may have to be otherwise accounted for. The inquiry of the Committee has revealed the fact that the presence of coal dust in proportions varying from 32 parts to 1 part produced almost identical results, which is a highly important discovery. The Committee report that ignitions of mixtures of air and coal dust, with or without the presence of fire-damp, can be obtained when there is present a much smaller quantity of coal dust than has been previously supposed to be necessary. It does not appear that any line of safety has been drawn by the Committee; but it is obvious that not only in mines, but in ships and coal-stores where coal is continually being loaded up, causing a very dusty atmosphere, the risk of explosion should be carefully guarded against.

The Use of Gas for Singeing Fabrics.

The singeing of fabrics by gas has been discussed by Herr E. Schweitzer, who observes that the chief objections to the older machines constructed for this purpose were that they were liable to produce streaks of more or less partially singed fibre between the burners, as well as by the sudden lighting of the flames. Two or three years ago, Descat-Leleux devised a form of apparatus which is described as giving a very accurate and regular result. It consists of a metal case of hexagonal section, provided with a slit of from 6 to 8 millimetres wide, from which a mixture of coal gas and compressed air, in the proportions necessary to form a non-luminous flame, is burnt along the whole breadth of the machine. The entire arrangement is so contrived that it is instantly thrown out of action on the fabric, in the event of a stoppage of the machinery. The length of the singeing surface can, of course, be modified by simply closing part of the slit; and the intensity of the flame is increased or diminished by regulating the supply of compressed air and gas. In order to prevent the smouldering or burning of the goods by any sparks they may carry off, it is only necessary to pass them through damped rollers or a steam-chest. So long as the whole fabric does not get heated to above 100° C. in passing through the gas-flame, it will not be injured in any way.

Received.—"Spons' Architects' and Builders' Price-Book, with Useful Memoranda and Tables." By W. Young. (London: E. & F. N. Spon.) This is the twenty-third edition of this work; and among the additional information contained in it is a chapter on electricity, with complete specifications and estimates of electric lighting installations carried out by the author. There are also extra divisions on concrete, fireproof floors, and granite.——"Sewerage and Sewage Disposal." By Henry Robinson, M.Inst.C.E., &c. (London: E. & F. N. Spon.) The author states in his preface that he has confined his book as far as possible within the limits of data in connection with works of sewerage and sewage disposal; although, in dealing with river pollution and the filtration of impure water, the allied subjects of water pollution and sewage purification necessarily overlap. He has also summarized the chief conditions requiring to be complied with in the drainage of houses and the sewering of towns.

An Accountant on the Form of Gas Companies' Accounts.—At the meeting of the Incorporated Accountants' Students' Society of London last Tuesday evening, a lecture on "Gas Accounts" was delivered by Mr. E. S. Burton, A.S.A.A. Prefacing his remarks with an explanation of the manner in which gas companies came into existence, and with some observations on the Gas-Works Clauses Acts of 1847 and 1871, the lecturer pointed out that the statutory companies' accounts were kept in a form prescribed by Act of Parliament, the obligatory use of which was productive of great advantage to directors, shareholders, and other interested persons, as it enabled a very close comparison to be made between one company and another. To the auditor, the gain was a considerable one, as his duties at each successive audit would more or less take a regular form, and proceed on lines which, to a great extent, were definitely laid down. Copies of the prescribed form of accounts used were passed round for the inspection of the audience; and the mode in which the accounts were kept was explained in detail. The lecturer thought the adoption of this form of accounts, or some modification of it to suit the altered requirements, by industries other than gas companies, in any modified form would be highly beneficial.

TECHNICAL RECORD.

MANCHESTER DISTRICT INSTITUTION OF GAS ENGINEERS.

The Twenty-Sixth Annual Meeting of this Institution was held last Saturday, at the Grand Hotel, Manchester; and despite the unfavourable weather, there was a large attendance of members.

During the morning, the members paid a visit to the Bradford Road Gas-Works of the Manchester Corporation, where they were most courteously received by Alderman Higginbottom, the Deputy-Chairman of the Gas Committee, and Mr. G. E. Stevenson, M.Inst.C.E., the Engineer of the works.

Alderman HIGGINBOTTOM, in welcoming the members, on behalf of Alderman Gibson (who was unable to be present) and the Gas Committee, did not know that they could show the members anything with which they were not already acquainted. The only credit he claimed for the Manchester Gas Committee and Managers was that they always endeavoured to keep up with the times, and to place in their works the best mechanical and other appliances that they knew of. The party would be taken to see the new gasholder tank, and other portions of the works. He might add that they were also laying down a carburetted water-gas plant on Messrs. Humphreys and Glasgow's system; but as the construction of this was only just being started, they could not at present say much about it. He gave the Institution a hearty welcome to the works, and hoped the visit might be profitable to the members. He could assure them the Gas Committee always learned a good deal when such associations as this paid them a visit.

The PRESIDENT (Mr. George Smedley, of Buxton) thanked Alderman Higginbottom and the Gas Committee for their kind reception of the Institution. He observed that most of them were connected with much smaller works than those they were about to inspect; and therefore they could not fail to learn something from their visit, as experiments had been tried there, and plant put down on a scale which was not possible in smaller works.

The members then made an inspection of the station—Mr. Stevenson, Alderman Higginbottom, and other gentlemen connected with the works, explaining to the members the various processes and plant. The first portion of the works visited was the new gasholder tank, which is 254 feet diameter, with a depth of 50 ft. 6 in. to the rest stones. It is built of brick and puddle, and has inlet and outlet pipes 36 inches diameter. The timber framing is supported on 196 cast-iron columns resting on brick pillars, constructed in the tank for the support of the crown of the holder. The four existing gasholders are 150 feet diameter, with a total capacity of 6,800,000 cubic feet; and the new holder that is being erected is 250 feet diameter, to store 7,000,000 feet of gas. The works contain two retort-houses, 360 feet long by 70 feet wide, each fitted with 28 beds of through retorts with nine and eight retorts in a bed, and 940 mouthpieces. There are three of Cutler's and one of Clapham's water-tube condensers; two sets of twin exhausters and combined engines by Gwynne and Co., of 140,000 feet an hour capacity each; and also two sets by Laidlaw and Sons, of 120,000 feet an hour capacity. Four Livesey washers, each of 2,000,000 feet a day capacity, and four rotary scrubber-washers—three made by Kirkham, Hulett, and Chandler, and one by Clapham—are also provided. The purifiers are sixteen in number, each 32 ft. 9 in. by 26 ft. 6 in.; and six additional purifiers are to be laid down. At present, there are three station meters of 150,000 feet an hour capacity; but provision is made for a fourth meter of the same capacity. The carburetted water-gas plant, referred to by Alderman Higginbottom, will, when completed, be capable of making 6 million feet of gas per day. The present manufacturing power of the works is 8 million feet per day, and sufficient space remains on the premises to construct a new section of works capable of making 6 million cubic feet, which would bring the total manufacturing power up to 20 million cubic feet per diem. It may be added that West's air-compressing machines have been adopted at these works.

Mr. ISAAC CARR at the conclusion of the visit, moved a vote of thanks to Aldermen Gibson and Higginbottom, the Gas Committee, and Mr. Stevenson, for the invitation that had been conveyed to the Institution, and the kind way in which they had been received. He was sure all of them must have obtained a good deal of information, in seeing the manufacture of gas conducted on such an enormous scale.

Mr. J. BRADDOCK (Radcliffe) seconded the motion.

Mr. STEVENSON, in responding, said they were always pleased to welcome engineers to the works, and to have an opportunity of meeting face to face the principal workers in connection with the gas industry.

Mr. CHARLES NICKSON also briefly responded.

The members then returned in conveyances to the Grand Hotel, where lunch was served.

THE MEETING.

The business meeting commenced at two o'clock in the Masonic Room—Mr. G. SMEDLEY, the retiring President, in the chair.

The minutes of the previous meeting having been confirmed,

Messrs. J. H. Crowther (Wallasey), W. Everitt (Ilkley), and S. Meunier (Stockport) were elected members of the Institution.

The Hon. Secretary (Mr. S. S. Mellor, of Northwich) read the annual report of the Committee and the statement of accounts, which were of a very satisfactory character.

Mr. W. Carr (Stalybridge), in moving their adoption, said he was pleased to see that the Association was in a healthy and vigorous condition, and that there was a good balance in hand. The only matter of regret was the fact that Mr. Smedley, the retiring President, had so frequently been prevented from being with them at their meetings, owing to ill-health.

Mr. Harrison Veevers (Dukinfield), seconded the motion, which was supported by Mr. W. W. Hutchinson (Barnsley), and carried with acclamation.

The next business was the election of two Vice-Presidents.

Mr. J. Braddock, in proposing Mr. R. Porter, of Elland, as Senior Vice-President, observed that Mr. Parkinson, of Brighouse, would, in the ordinary course of events, have filled the position during the ensuing year. But as he had been prevented, owing to pressure of business and other matters, from accepting the office, his name had to be withdrawn, and the Committee had to look out for someone else. Their choice had lighted on Mr. Porter, who had already shown great interest in the Institution, and who would no doubt in the future, as opportunities presented themselves, be still more conspicuous; while his election would be accepted as a compliment by the Yorkshire members.

Mr. Mellor seconded the proposal; and it was unanimously carried.

Mr. Porter, in thanking the members, said he would endeavour, to the best of his ability, to serve the interests of the Institution to the satisfaction of the members.

Mr. T. Newbigging (Manchester) proposed Mr. W. S. Haddock, of Warrington, for the office of Junior Vice-President.

The President seconded the proposal, and it was carried.

Mr. Haddock briefly thanked the members.

Mr. Newbigging was then re-elected Treasurer.

The next item on the *agenda* was the election of a Secretary for the ensuing year.

Mr. Isaac Carr, in proposing the re-election of Mr. Mellor, who has held the office for the last six years, observed that it was only with difficulty that Mr. Mellor could be prevailed upon to allow himself to be proposed for another year; and when his consent was finally obtained, it was only on the understanding that he would retire after he had completed his seven years of office. Everyone knew how well Mr. Mellor had performed his laborious duties; and he was sure that the members would all agree that he had filled the position with credit and honour both to himself and the Institution. They could not have a better testimony of his good work than that which was found in their present prosperous condition.

Mr. R. Hunter (Chester) seconded the motion.

Mr. J. Chew (Blackpool), in supporting it, suggested that they should not, when Mr. Mellor resigned the office, let him retire without showing in some special form their appreciation of his valuable services.

Mr. J. West (Manchester) agreed with the suggestion.

Mr. Carr remarked that this point had not been overlooked by the Committee.

The President said the proposal as to a testimonial had his hearty support.

The motion was then unanimously carried.

Mr. Mellor, in thanking the members, observed that his object in retiring after the completion of his new term of office was the belief that a little change was often beneficial both to individuals and societies.

Two vacancies on the Committee had then to be filled up; and Mr. C. A. Craven (Dewsbury) and Mr. G. E. Stevenson (Manchester) were selected.

Mr. Craven, in accepting the post, expressed a desire and belief that Yorkshire and Lancashire would always, in future, work together amicably in connection with the Institution.

Mr. Stevenson also briefly thanked the members.

Messrs. Smith and M'Kenzie were re-elected Auditors.

The New President.

The Retiring President then introduced the President-Elect (Mr. Isaac Carr, of Widnes) to the meeting; adding a few words of thanks to the members for the kindly expressions of sympathy which they had from time to time forwarded to him through their Secretary, when he had been prevented by ill-health from being with them. He was sure, however, their new President—who was a man of remarkable energy, and who always, in whatever he did, worked for the best interests of the Institution—would make up for any deficiency that he himself had shown.

INAUGURAL ADDRESS.

Gentlemen,—My first duty on rising to address you is to express my deep appreciation of the honour you have conferred upon me in electing me to preside over your deliberations for the forthcoming year. While I am proud to have my name associated with the honourable office of President of this large and important Institution, I am at the same time keenly sensible of the responsibilities of the office, and of my inability to discharge those responsibilities with the competence they deserve. I can only promise, therefore, to put forth my best effort in the conduct of your business, and to trust to your kind indulgence to overlook my shortcomings.

The continued prosperity of the gas industry is a matter for congratulation, and more so than usual at the present time, I consider, on account of the enormous amount of lighting now being done, in the principal towns and cities of the United Kingdom, by our firmly-established competitor the electric light. On the face of it, it would seem almost incredible that these numerous electric lighting installations, many of which have been for years established, can go on increasing their business so enormously as they are doing by taking over for the most part the cream of the gas consumers in the hearts of our districts, without affecting to any appreciable extent the ever-increasing demand for gas. That this is so cannot be other than a source of great satisfaction to all interested in the welfare of the gas industry. But, to my mind, while we are observing with satisfaction the present state of affairs, we should not be unmindful of the future; for the problem is before us, as to whether this increased demand for gas is to continue, and, if so, to what extent. The time has now arrived, I trust, when all members of the gas profession recognize the fact that not only is the electric light here to stay, but to increase in magnitude quite as rapidly as gas has ever done, and is in every respect a competitor worthy of our steel. Nothing can prevent the electricians from effecting improvement that will gradually reduce the cost of the light, and strengthen their position; and it ought to be scarcely necessary for me to add, that we makers of gas are equally determined to follow the same line of action. We have much to encourage us; for the recent discoveries in acetylene and other directions, together with the great strides of incandescent lighting clearly demonstrate that gas making is as much in its infancy, and as capable of development, as that of generating electricity. While personally, I take anything but a pessimistic view of the future of the gas industry, I do assert that the position is changing, and that the much-vaunted monopoly we have so long enjoyed is being seriously assailed, and, further, it will be necessary for the gas engineers of the future to put forth greater efforts than those of the past have done to maintain the position we at present hold.

The monopoly we once held in the manufacture of residual products has long been a thing of the past; and now the time is near at hand when gas lighting must depend much more upon its merits. We have, and, there is little reason to doubt, shall continue to have, the great advantage of cheapness over our rival; but it cannot be for a moment disguised that this economic consideration carries little or no weight in our wealthy business centres, contrasted with the great convenience and superiority of electricity over gas for many kinds of lighting.

While we admit the superiority of electricity for decorative lighting—for which reason the wealthy classes have already so largely adopted it—we have our future field of development with the masses. With the improvements that may be reasonably expected as the outcome of a healthy and vigorous competition, I believe the cost of manufacture will be reduced and, with the natural increase of population, we shall find an ever-widening market; and it will be seen that electricity is no more capable of staying the continuous increasing demand for gas, than gas has been able to stop the ever-increasing consumption of oil and candles.

The future prosperity of the gas industry, must be a matter of degree; and the question of this degree depends to a great extent upon the personal ability displayed, and exertions put forth, by the members of our profession. While, as I have just stated, our industry will continue to hold its own, it will not be by the same ease of effort as in the past. What has in times gone by passed muster for engineering and management will not in the future be possible; while the lighting efficiency will have to be maintained, the cost of production will have to be reduced. In constructional work, the reckless expenditure which was the fashion with some engineers of the past, will not bear repetition without bringing financial ruin upon those concerned. We have among the members of this Institution, gentlemen who have their management at present crippled through their works being over-capitalized by their predecessors; and, unfortunately, the hardship of mistakes of this kind does not stop here, but falls as a perpetual tax upon the gas consumer. What we need to realize in this shifting ground is that we shall stand on a level with men responsible for ordinary industrial competitive business, in which capacities only the fittest survive. That the time-honoured custom of raising the price of gas 3d. or 6d. per 1000 cubic feet on the grounds of bad trade (the real ground often enough being bad management), which, when secure in monopoly, could be done with impunity, will, in the future, be our rivals' opportunity, and they will not be slow to take advantage of the situation. We have the situation before us. Let us accept it, and determine each one of us to do something in the way of original research. No man knows what he himself is capable of until he puts forth his effort; and if, in the end, failure in the direction he was actually seeking awaits him as a reward, he may console himself with the certain fact that he, by his effort, has added to some extent to his own store of knowledge.

There are two classes of inventors—those to whom it may occur as an inspiration of genius, and those to whom invention may be described as the logical outcome of a well-trained and energetic individual, working on certain lines until he evolves some-

thing as the result of his investigations. Of these two, I need hardly say that the latter is the more valuable; not alone for what he discovers, but for what he eliminates. Once in a while, the former accomplishes something great; but most of his fancies are old and improbable. The latter, however, never ventures forth until some progress has been made; and even though he may not have accomplished much, he may have swept away much of what was useless in the process. In the gas world of the British Isles, there has been a dearth of invention or improvement for some time past; so much so, that our leading engineers have been fain to take lessons from our American brethren in matters of gas enrichment.

Under the circumstances, I approach with some diffidence, the little I have been able to accomplish myself. What I published some time ago was demonstrated to be scientifically impossible; and, after having had the audacity to go on doing what was scientifically impossible, I am not quite sure whether it is wise on my part to again make public any further results. However, acting on the impression that the science of yesterday is only the incomplete knowledge of to-day, I will venture.

It will be remembered by many, that in November, 1889, I had the privilege of reading before this Institution a paper on the subject of carburetting gas in its own tar. The title of the paper, also of a supplementary paper in February, 1890, was "The Dinsmore Process." Mr. Dinsmore's first patent, and plant originally adopted at Widnes, was to take the gas from the hydraulic main back through a heated retort or duct, and to introduce a stream of liquid tar into the heated retort at the same time, which was to be gasified and converted into permanent gas of very high quality. In his experimental plant, Mr. Dinsmore was said to have obtained some extraordinary results; but when a similar plant was introduced at Widnes on a larger scale, it was fraught with so many difficulties in ordinary working, that it was abandoned in favour of the plan which has been at work since 1889, and which has given very satisfactory results. The chief difficulty connected with this process has always been, and still is, its tendency to block up the apparatus with pitch. Gas may be made in the ordinary way without any scientific knowledge on the part of those who are making it; but this process, depending as it does upon conditions that can so easily be outraged, requires some theoretical knowledge to keep it in the groove wherein its efficiency lies.

After struggling for a very considerable period with Mr. Dinsmore's plant, with varying results—sometimes encouraging, but often enough disappointing—the idea occurred to me that considerable loss was entailed by taking the gas into the hydraulic main, and then bringing it back into the heated duct along with the tar that had already been taken from the gas and condensed. Why not take the gas through the duct while it still contained the tar in a gaseous form? It would surely be easier to render it, or some portion of it, permanent while in that form than after it had been liquefied, as it is well known that the gas that is given off during the first half hour after the coal is put into the retort is heavily charged with tarry vapour. Acting upon this idea, I designed and erected the apparatus described in detail in the paper just alluded to. The system is applied to single beds of retorts, the duct alone going through, and is fitted with a door at the back which has to be opened daily to clear off the deposits of pitch and coke formed from the pitch falling down the water-jacketed ascension-pipe; and it is this facility for catching and clearing the pitch that has made the process feasible and workable.

The process has been continued (considerably extended) since that date; and we are now making about one-third of our gas on the system. One-third only is being made, because this is sufficient to maintain the whole of the gas up to the required illuminating standard. I stated in my paper that the value of this process to us, situated as we are so favourably for the manufacture of residual products, was to be found in its carburetting power. Not only does it do away with the use of cannel, but admits of the use of coal of lower quality than it had ever previously been deemed expedient to use; so that we have now, in fact, reached a point in the price of gas where the residuals are just about as valuable as the gas, and there remains no advantage in increasing the yield of gas per ton. Therefore, having sufficient retorts on the tar process to maintain the required standard of illuminating power, the remainder of the carbonizing plant remains on the ordinary system.

The value of the gas produced by this composite arrangement has been certified by Mr. C. R. Bellamy, Gas Analyst for the City of Liverpool, to be as follows:—

TABLE A.

Year.	No. of Tests.	Illuminating Power.
1891–2	23	18·09
1892–3	24	18·21
1893–4	24	19·06
1894–5	25	18·55
March 1895 to date	19	18·64

The photometer used is of the Evans closed type; and the burner is the Sugg "G" argand. Mr. Bellamy is absolutely independent. He visits Widnes whenever he thinks fit, without giving us notice of his coming; and the results reported by him are, to the best of my knowledge and belief, a fair representation of the average quality of the gas the year round, during the whole of the time covered by the above table.

At the time this process was engaging public attention, it was strongly objected by some engineers of eminence that the results did not conform to the theory of gas manufacture which had been held to be correct for many generations past. Engineers and chemists had in the past laid down certain rules and tables; and these have gone on undisputed for such a length of time, that they have come to be regarded as infallible truths or laws, and anything which violated them must of necessity be wrong. If the theory and the facts disagree, as in this case, then so much the worse for the facts. As, for example, it has been argued by some of our wise men that two gases of the same specific gravity must of necessity be of the same illuminating power; the difference of composition notwithstanding.

The theory of the process at work at Widnes, so far as it is understood (for I believe we have yet much to learn), is that when a charge of coal is put into a fire-clay retort, and when the low conductivity of the fire-clay material is taken into account, the temperature of the inside of the retort must be greatly reduced; and for a considerable time tar vapours, with only a small portion of permanent gas, is being distilled from the coal. These, passing up the ascension-pipe at a comparatively low temperature are largely condensed in the hydraulic main. When the retort gets sufficiently hot that destructive distillation may take place, it begins to convert these vapours into a more permanently gaseous form, and to expel sufficient negative gas from the coal to form a carrier for the vapours thus produced. It may therefore be taken that a retort practically does the whole of its own work after the first half hour; and during the last two hours of a six-hour charge, is sending forth only negative or carrier gas. Where the retort requires assistance therefore is during the early stage of the charge, when its own temperature has been reduced so low, that destructive distillation cannot be carried out; and it is here that the duct can, and does, serve a useful purpose, for it supplies the temperature which, for the time being, the retort lacks.

As applied at Widnes, to a setting of six retorts on six-hour charges, so that one retort can be charged every hour, it acts most effectively, because the gases from each retort are passing into the duct together in every stage of distillation—the rich bituminous vapours of the first hour, with the purely negative or carrier gases of the last hour, and all the intermediate stages at the same time. That it will rob the tar of its naphthas and light oils is plain; but it does more—it converts many of these vapours into the higher hydrocarbon series. For example, a considerable quantity of acetylene and probably ethylene is formed, the illuminating value of which is out of all proportion to its bulk or weight when compared with olefiant or marsh gas; and it is this fact that has puzzled those who believe in the specific gravity theory as a guide to the illuminating power. That there is an increase in the quantity of acetylene in tar-carburetted gas over that of the ordinary, is shown by the following extract from a report on the chemical composition of our gas by Mr. Francis Jones, F.R.S., F.C.S.

The Beyer Laboratory, Grammar School, Manchester, April 27, 1889.

Having undertaken to make a chemical examination of the gas made by the Dinsmore process, I have thought it best to begin by determining the amount of acetylene—a constituent always present in coal gas, and one which has a very high illuminating power. Accordingly, I visited the works at Widnes on the 16th of this month, and collected the acetylene from one cubic foot of the gas; and I find the quantity present corresponds to 0·14 per cent. This amount is considerably above that usually present in coal gas; and I may add, for the sake of comparison, that, although I have repeatedly determined the amount of acetylene in Manchester gas, I never found it to exceed 0·05 per cent.

I have previously mentioned that difficulty arises sometimes, through the stopping up of the outlet-pipes with pitch, caused sometimes by the supply to the water-jacket pipes being stopped, or carelessness in allowing the heat of the duct to become excessive. Further, there is at times a little difficulty in opening and closing the 4-inch plug taps between the retort mouthpieces and the duct. When the vapours of the first part of a charge (which comprise the principal lubricating agents in connection with the taps) have been worked off, the dried gases which follow have a tendency to impede the motion by the deposit of hard pitch, and more especially is this inconvenience felt, when the hardening property of the pitch is assisted by a strong cold wind impinging on the mouthpieces. From this and other causes, several engineers who have tried it have admitted their inability to deal with it; while others have gone the length of condemning it. However, "the proof of the pudding is in the eating;" and the test of efficiency of any process of gas manufacture is, and must always be, the amount of economy effected by the process.

As much attention has been drawn to the various processes of enrichment by oil, I have worked out [Table B, p. 458] our cost of manufacturing and delivering into the holder, in the way that has become familiar to us, in connection with those processes. It will be seen that the actual cost of manufacture up to putting the gas into the holder, during the whole of the year ending March 25, 1895, was slightly under 5¾d. per 1000 cubic feet. During the last year, our contracts for coal were upon so much better terms as to reduce the cost by 1·3d. per 1000 feet; so that, assuming that other things remain the same, it will bring the cost to a fraction under 4½d. Our financial year is so near its close that I am in a good position to judge, and have little reason to doubt that such will be the case. The cost of manufacture and maintenance will be seen from Table C.

TABLE B.—*Cost of Manufacture of Gas per* 1000 *Cubic Feet at the Widnes Gas-Works for the Year ending March* 25, 1895.

		Cost per 1000 Cub. Ft. Pence.
Cost of manufacture only—		
Carbonization (coal, stokers' wages, &c.)		12·629
Purification (oxide, lime, &c.)		0·645
Sulphate of ammonia, vitriol, &c.		0·634
Yard labour		0·537
		14·445
Less revenue from residual products—		
Coke and tar	5·425	
Sulphate of ammonia	3·305	
		8·730
Total cost of manufacture		5·715
Less reduced cost of coal this year		1·300
Total cost of manufacture for present year		4·415

TABLE C.—*Cost of Manufacture and Maintenance.*

		Cost per 1000 Cub. Ft. Pence.
Carbonization (coal, stokers' wages, &c.)		12·629
Purification (oxide, lime, &c.)		0·645
Retorts		1·062
Sulphate plant and repairs		0·671
Yard labour		0·537
Repairs to works and machinery		1·183
		16·727
Less revenue from residual products—		
Coke and tar	5·425	
Sulphate of ammonia	3·305	
		8·730
Cost of manufacture and maintenance		7·997
Less reduced cost of coal this year		1·300
Cost of manufacture and maintenance for present year		6·697

From the above it will be seen that the cost is a little less than 8d. per 1000 cubic feet; or, if I credit myself with the lessened cost of coal, a fraction over 6½d. per 1000 cubic feet.

The total cost of manufacture and distribution, including all standing and other charges, may be stated as under:—

TABLE D.—*Cost of Manufacture, Maintenance, and Distribution, including all Charges.*

	Pence.
Manufacture, maintenance, and distribution	28·246
Less revenue from meter and stove rents, fitting trade	1·003
	27·243
Less for public lighting and repairing lamps	2·705
	24·538
Less revenue from residual products	8·730
Cost of manufacture, maintenance, and distribution	15·808
Less reduced cost of coal this year	1·300
Cost of manufacture, maintenance, and distribution for present year	14·508

The total actual cost at the consumer's burner, being less than 1s. 4d. per 1000 feet, is, I think, a very creditable figure; and if I take credit, as in the previous cases, for the reduced cost of coal, during the current year, it brings the price down to the phenomenally low figure of 1s. 2½d. per 1000 cubic feet.

Some efforts have been made by others, to work out this process on somewhat different lines to that adopted at Widnes—notably by Mr. Thomas Duxbury, late of Darwen, Mr. Tim Duxbury, of Middleton, and others; but, as I am unacquainted with the results obtained, I must be contented with what I have been able to accomplish, and trust that those members of the Institution who have had experience will at some early date give us the benefit thereof.

Should any member decide to favour the Institution with the benefit of his experience upon this subject, I should like to offer him a word of warning, or prepare him for the discouragement he will in all probability have to encounter. He may be told that he is claiming to do the impossible, or that he is the only man unreasonable enough to dream of the possibility of such things. The "JOURNAL OF GAS LIGHTING," speaking about Mr. Ellery's paper on "The Application of Coal Tar for Making Gas," on July 10, 1894, said:—

> We believe it is the truth that at this moment there is no gas manager in the United Kingdom actually carbonizing the whole of his tar; and, perhaps with the solitary exception of Mr. Isaac Carr, of Widnes, it would be quite safe to say also that there is not a gas manager in the kingdom who would not rather sell his tar off at any price, from a penny per gallon upwards, than make any other use of it whatever. The impression created by such papers as that of Mr. C. Stafford Ellery's is, in brief: What is the good of it? . . . . It is at least certain that if the manufacture of tar gas is a profitable proceeding, the position of such gas managers as Mr. W. R. Chester—who maintained a discreet silence respecting this subject—and Mr. Alfred Colson is untenable.

The Editor of the "JOURNAL OF GAS LIGHTING," in addition to his main object of trying to sell copies and get advertisements, seems to think he has a mission to sit upon, or otherwise discourage, any original effort which does not emanate from a certain coterie of engineers. Let one of that coterie bring ever so small an original, or even some long-forgotten process or idea, forth, and it will cackle like a hen over a new laid egg. I do not dislike criticism, however free it is, if fair or intelligible; and I trust that none of my colleagues in this Institution at least, will ever be deterred from doing what they can or speaking about it whenever they feel inclined for fear of what such critics may say.

The question as to the policy of taking gas profits to ease the burden of the ratepayers, in towns where the gas-works are owned by corporate or other local bodies elected by the ratepayers, is a matter which might with advantage be dealt with by this Institution. I hold the opinion that the policy is a bad one. In a discussion on the subject before this Institution, at a meeting held in 1883, I expressed myself to this effect; and the experience gained during the twelve years that have since elapsed, has only tended to confirm me in the opinion then expressed. Indeed, circumstances have happened, and are happening now, which make it appear to me almost a suicidal policy—at any rate, it makes it decidedly unfair and unjust to that long suffering and sorely tried individual, the gas consumer.

Many corporations have put in installations of electricity for lighting purposes, both public and private; and I think I should be quite safe in saying that in not one single instance is the electric light more than paying its own way. I am aware of many cases where it does not; and I am anxious to know from whose pocket the deficiency is made up. Does the ratepayer, who is supposed to have such large responsibilities in regard to gas-works, find the money? I am afraid not. The gas consumer comes in handy for little matters of this sort: so that the poor tradesman in the back street has to pay a little more for his gas in order that the swell tradesman in the front street may have the electric light, which he uses chiefly as an advertisement to draw custom from poorer tradesmen in out-of-the-way districts. That this is distinctly unfair, goes without saying.

Again, there are many large concerns—such as cotton mills, iron-works, &c., which have their own private electric lighting installations. Whether they make them pay or not, is a matter with which we are not concerned. But they are large ratepayers; and to tax the gas consumer in order to ease the burden of such ratepayers as these, I say again is distinctly unfair.

Other people who own large warehouses, which occupy some of the best portions of our large towns and cities, who are large ratepayers but very small gas consumers, as well as those who still manufacture their own gas, gain greatly by a reduction in the rate; while the high price of gas affects them very slightly, as they either consume very little or none at all. If the incidence of the burden was the same in all cases—that is, if the gas rose as the rate fell, and it was simply taking money from one account and putting it to another in each ratepayer's and consumer's account, much of the sting would be removed; but it is anything but that. It is generally taken from the pockets of those who can least afford it, and put into those of people who have least need of it. By this process the consumption of gas is discouraged, while that of electricity and oil is encouraged.

It is frequently recited in all parts of the kingdom by aldermen and councillors, when attempting to justify this marauding policy, that the ratepayers as owners are entitled to exact from the gas consumers such sums of money as they may, according to their own idea, deem sufficient to compensate them for the formal liability the district rate is under in standing security for the money borrowed on the gas-works. They sometimes further argue, as another justification of their action, that they are only taking their own money back, on the ground that the rate of interest at which these loans are obtained is much lower through being backed by the district rate, than it otherwise would be; thereby resulting in a large annual saving. With regard to the latter contention, I say that the advantage, if such it be, is infinitesimal; for the business of the average gas-works can and does afford in itself security on its loans equal almost in the eyes of capitalists to that of Government consols. That this is so, is demonstrated by the low rates of interest at which some of the issues of mortgage debenture stock of gas companies have been subscribed.

With regard to the actual liability of the ratepayers, if one should venture to question this as being more imaginary than real, he is at once confronted by the Act of Parliament, wherein it is plainly set forth that the district rate is liable for the interest on the loans in the event of the gas-works failing to produce that sum from its own business. But while granting this, I would ask for an instance where the money of the ratepayers of any town has been called upon to supply the deficiency of a gas-works account in any other form than that of a loan to meet some sudden or temporary difficulty—that is to say, a case where money has been advanced out of the pockets of the ratepayers, and the capital and interest to the last penny not repaid. Personally I do not know of a single case where ratepayers have been rendered permanently out of pocket through having been possessors of their own gas-works. The gas consumers of this country have, up to the present, paid their own way, and have in reality stood security for their every liability; so that to my mind, the ratepayers' representatives have no justification for pursuing the policy I complain of.

If corporate bodies could only see it, they are likely to earn far more credit by selling cheap gas than by lowering the rates out of gas profits. I am not sure that it does conduce to a reduction of the rates; I am more inclined to think it leads

to a policy of extravagance, which in many cases has caused an increase in the rates as well as dear gas. When it is considered that it takes away all the stimulus from the management, the evil of the policy becomes more than ever manifest. The gas manager has nothing to strive for. If he makes more profit, it is swallowed up in the rates, and he gets little or none of the credit due to him; and so the management often becomes a matter of trimming your sails to the various local and political winds that blow, and taking life as easy as the said winds will allow. How different it would be if every man was placed upon his merits, and the price of gas was an indication of the value of his management! Under those circumstances, the committees of some of our large corporations, who at present seem to consider a properly qualified manager a superfluity, and manage after a fashion the works themselves would be fain to make room for a capable man to take charge of their undertakings. Personally I have been very fortunate in that I have had a Committee who have gone very far with me in the direction I wished to go. Still I should have liked them to go the whole length, I should have liked to have had the pleasure (and I can assure you I should have considered it a great honour) of selling gas at 1s. 6d. per 1000 cubic feet. This question is one upon which there are a variety of opinions held by the members of this Institution; and I trust that the few words that have fallen from me will prove a sufficient inducement for some member to re-introduce the subject in the form of a paper.

Another matter which has not been before this Institution for a considerable period is that of the differential rates in the selling price of gas. An interchange of ideas upon the equity of charging a uniform rate, or nearly so, alike to large and small consumers, as is the custom in many towns, cannot be other than of advantage; and I am quite sure that such a subject, if introduced, would be productive of a useful and valuable discussion.

The introduction of the penny-in-the-slot meter system in many towns is having the much-desired effect of reaching a class of consumer who, prior to its invention, were beyond the pale of gas authorities. Besides increasing the consumption of gas, it is evident that this system is supplying a much-felt want with the people. That this has been the case in Widnes, is evinced by the rush of applications that followed close upon its inception. The first intimation to the townspeople was an advertisement in the local papers setting forth the principal conditions, which were as follows: Thirty feet of gas for a penny, service-pipes, meters, internal pipes, and fittings up to four burners, together with one ring boiling-burner, fixed free of all cost. Each bracket and pendant is fitted with a 4-feet governor burner; and the tenant has the option of having a burner fixed in four separate rooms. The number of houses within the borough of Widnes is about 5000, out of which only some 1700 were gas consumers at the time the prepayment system was introduced. I may remark, by the way, that this small percentage of consumers may be accounted for from the fact that it was not until late years the custom for builders in Widnes, when erecting property, to fit them with internal pipes and fittings; so that notwithstanding the low selling price of our gas, the absence of internal fittings has debarred many who would have used the gas under the ordinary system.

The advertisement appeared in October, 1894; and in the first three months 800 applications were sent in. These have gone on gradually increasing, until they have now reached 2250. 1600 houses have been fitted up; and the average annual consumption, judging from those that have been in use for the full period of twelve months, averages about 8500 cubic feet per meter. The average cost of fitting up these houses, including service-pipe, meter, and fittings complete, is £3 15s.; exclusive of the service-pipe, the average cost is £3 5s. With the above consumption, the system is just remunerative, as the extra shilling per 1000 feet over the ordinary selling price allows 10 per cent. interest and depreciation on the cost of the meter and fittings; leaving a balance of 3d. per 1000 feet to cover cost of collection, inspection, and repairs to the cash attachments.

In consequence of the great rush of applications at the outset, the work of fitting up the houses was unavoidably very much behind; and on account of this, many of the would-be gas consumers became very irate and impatient, and assailed me with letters of almost every conceivable type—some mildly abusive, others pleading various domestic reasons why they should be specially favoured, and often enough the dire threat that unless the gas was immediately connected the application would be cancelled. But of all the communications, the most diverting were those who appealed to me to give them preference on economic grounds, pointing out the greater expenses of oil as an illuminant over that of gas. We gas makers are not accustomed to hearing this sort of argument advanced by the general public; but at the same time, there is little doubt that oil burnt in an ordinary class of lamp, such as in general use, is more expensive than gas at 30 feet a penny.

Mr. Lewis T. Wright, in a paper on the future of the coal gas industry, read before the Society of Chemical Industry in May, 1888, gave the following particulars of his investigations in this direction, viz.—

He had been at some pains to ascertain the cost of mineral oil lighting compared with gas lighting. The best result, with a duplex lamp burning paraffin at 8d. per gallon, was 5·63d. per 1000 candles per hour. The extreme result with the same lamp, burning petroleum at 1s. per gallon, was a cost of 11d. per 1000 candles per hour. The Lampe Belge gave, with petroleum at 1s. per gallon, 1000 candles per hour for 7·9d. At Nottingham, gas of an average price of 2s. 3d. per 1000 cubic feet with the Schülke recuperative lamp, yielding 10 candles per foot, would provide 1000 candles per hour at a cost of 2·9d.; the Wenham, at 7 candles per foot, 4·1d.; and the ordinary flat-flame burner, at 3½ candles per foot, 8·3d.

From this it will be seen that gas burnt in the ordinary flat-flame burner is only slightly more expensive than oil when the latter is burnt under the most favourable conditions in the best form of lamp. But if regenerative burners be used, the balance of cost is at once in favour of the gas; and if we make the comparison between the duplex oil-lamp and a modern incandescent burner giving a duty of 20 candles per foot, we get the almost incredible comparison of gas, light for light, costing but one-fourth what oil does—that is, on the basis of 2s. 3d. per 1000 cubic feet.

A very necessary protective clause is inserted in our application forms, binding the consumer to pay upon the quantity of gas registered by the index; so that in the event of the cash attachments becoming disarranged, as they sometimes do, allowing the gas to pass without payment, or in the event of cash being extracted from the box, we are protected. Great improvements have recently been made in the manufacture of the cash attachments; and while there are many very excellent types on the market, I have found it necessary with the best of them before fixing to run them through with (say) three pennyworth of gas, to ascertain that the quantity passed per penny is neither more nor less than that prescribed.

Some managers who have not yet introduced the system are exercised as to whether or not the system will be permanent. Some seem to fear that, after the novelty wears off many may return to the use of oil. It is difficult to say how this will be in towns where 18 to 20 feet per penny only is given; but in those giving 25 to 30 feet, the possibility of such a turn of events is, I am sure, of the remotest description. In no single case have we had a meter given up. All our consumers are exceedingly well pleased with the system; while many are most eulogistic in their enumeration of its many conveniences. Although the system with us is not a great profit producing one, its introduction has been a source of great satisfaction to the members of the Widnes Town Council, inasmuch as it is rendering the dwellings of the poorer classes of the town much more cheerful, and is gradually displacing that terrible instrument of death the paraffin oil-lamp, to which, in Widnes alone, so many lives have already been sacrificed.

Since the recent meeting of Parliament, the Government have intimated their intention of re-appointing a Select Committee to again inquire into the question of the use of dangerous mineral oil-lamps, owing to the large increase in deaths resulting from lamp accidents. When this Select Committee do meet, I think the Council of The Gas Institute would do well if they brought under their notice the advantages of the prepayment meter system, as a means of affording greater immunity from oil-lamp accidents.

If the number of inquiry circulars that are sent round is any indication of the want of information upon any subject, I think most of you will agree with me that the subject of the prepayment meter system is in most urgent need of being well written up and discussed; and, further, it is a matter upon which the members of this Institution have not yet had an opportunity of expressing their views.

Much has been said from time to time anent the objects and benefits of this and similar Institutions. To my mind, this is a point upon which reiteration is necessary—especially for the benefit of the younger members; and it should be ever kept before them that, in joining the Institution, they incur a responsibility beyond that of paying their annual subscription. The end and aim of the founders was that the Institution should prove a means to an end, and not an end in itself. This end can only be realized, and the good work carried on by each member recognizing his duty, and taking an active part in the transactions.

There are other matters I should like to have touched upon, had time permitted; but these must now be left to other opportunities. I trust, however, that I have already said sufficient to induce some of our members to take up the subjects I have mentioned in the form of papers; and if this is done, my remarks will have served a useful purpose, and the Institution will be provided with a sufficiency of useful matter for discussion during the forthcoming year.

Mr. Stevenson, in moving a vote of thanks to the President for his interesting address, expressed the hope that the various points touched upon would be taken up by the members at future meetings.

Mr. Chew seconded the motion, observing that Mr. Carr had struck the key-note as regards the competition of the electric light, which was being supplied by many corporations at less than cost price; the gas undertakings having to furnish subsidies to make good the deficiency.

A vote of thanks to the retiring President was moved by Mr. Veevers, who referred to the able manner in which he had filled his post, despite his unfortunate illness, and congratulated him on his apparent recovery.

Mr. Mellor seconded the motion, which was adopted.

The Installation of Carburetted Water Gas at Blackburn.

Mr. S. R. Ogden, of Blackburn, then read the following supplemental paper on the above subject:—

As requested at the last meeting of this Institution, I have pleasure in placing before you some further facts and opinions in connection with carburetted water gas, bearing more particularly upon the special points on which more information was required. I do not propose to go farther into the details of working, cost, &c., than I have already done; but I may say that the plant at Blackburn has been continuously working since, yielding the same satisfactory results.

As Regards the Calorific Value of the Gas.—It was stated that the difference between carburetted water gas and coal gas was from 10 to 15 per cent. in favour of the latter; but after experiments I have made, I am of opinion that it does not differ. The method adopted for arriving at this conclusion was to raise one gallon of water to a temperature of 200° in a copper kettle, with a dome-shaped bottom, enclosed in a casing. The heat from the burner was thus able to play well over the kettle; and, being enclosed, better results were calculated upon. In this way, three gases were tried—viz., carburetted water gas, coal gas, and the mixture of the two gases as supplied to the town. The results were as follows:—

Carburetted water gas	145°	per 4½ cubic feet.
Coal gas	136°	
Mixed gases	136°	

It will thus be seen that, with the mixture as at present supplied to the Blackburn consumers, the difference is, as before stated, inappreciable.

Regarding Carbon Monoxide.—It is quite true, as stated, that carburetted water gas contains a large quantity of carbon monoxide; and this is a question which has been previously discussed. We are, however, all well aware that we have a varying quantity of from 7 to 12 per cent. in our ordinary coal gas, so that we cannot be charged with introducing a foreign element; and the question as to whether we double this quantity, is in my opinion of not much moment, seeing that we already supply what everybody recognizes as a poisonous and dangerous gas. But we have added to this gas an advantageous element in a more pungent and disagreeable odour for its detection, and one which will not be tolerated longer than necessary for the finding and rectifying of its source.

Condensation.—For the purpose of ascertaining if any undue amount of condensation occurs in connection with this gas, I am sorry that we have not had what in one sense may be called a typical winter. But I caused a spare holder to be filled with about 600,000 cubic feet of mixed gas ready for distribution, which, after a period of 17 days, was dispensed to the consumers, having lost 1¼ candles in value. This loss in value I may take as being what it would be expected that ordinary gas stored for such a time would suffer, and consequently cannot attribute any diminution in the quality to the carburetted water gas. I omitted to say that, during the seventeen days, we had five or six days of frost, and very changeable weather for the remainder of the time.

Cost per Thousand Cubic Feet.—The cost per 1000 cubic feet appears to be considered as very heavy; but I fear the advantages reaped in the other departments have been overlooked. The use of this gas in lieu of coal gas seems to be the principle on which the price is called heavy. But I would remind you that it would be practically impossible, with the small quantities procured and the price of anthracite coal, in this country, to put such a gas on the market unless in conjunction with an ordinary gas-works. Its substitute coke being a principal factor in its manufacture, cannot be bought so cheap as on our own works, where it has, in many cases, to be practically given away. Therefore it must be manufactured in conjunction with coal gas; and unless some are blessed with duplicate mains to their consumers, it would be impossible to supply it directly thereto, and must go as a mixture.

The questions might now be asked for what purpose shall we utilize such a plant, or what is it capable of being used for; and, if put to use for any one purpose, are any other advantages likely to accrue therefrom? To the latter question, I answer decidedly "Yes; that whatever purpose the plant may be intended to serve, you will be sure to obtain other benefits." Take my own case, where the plant was put in for producing purposes. My gain has been fulfilment of all I could wish in its producing qualities; better price for coke, owing to there being a less quantity for sale, through less being made in the ordinary way and part being used in the plant; a reduction in my coal and cannel account, through being able to enrich by means of the gas made to meet my demands; and, lastly, an increase of plant at a very much less cost than that at which an ordinary works could be initiated.

Further, an engineer who feels that he has at his command a plant on which he can rely at short notice to do all that is necessary, is relieved to a considerable extent of the worry and anxiety so often suffered by most of us at critical times. But this is not all; the means of starting or stopping the plant also gives one an easy chance of working where one should happen to be short of storage room. It is peculiarly adapted for this purpose; and to those placed in such a position, with no room without a heavy outlay for land, &c., is worthy of consideration. It must not, however, be inferred that I advocate in any sense shortness of storage capacity.

Coming again to the prime cost of the carburetted water gas, we must deduct such sums as are gained through being able to enrich the gas, and by the better price for coke obtained by the use of such a plant. Given, therefore, a supply of oil at from 2d. to 3d. per gallon, I am of opinion that carburetted water gas can be manufactured at a less cost than coal gas.

In the course of a short discussion,

Mr. D. Terrace (Middlesbrough) observed that Mr. Ogden had simply mentioned condensation as from the holder, but had told them nothing about condensation in the mains.

Mr. T. Newbigging expressed his disappointment at the rough form in which the paper was presented. Previously the author had given the difference in heat between water and coal gas at 10 to 15 per cent.; and now he said it was only 10 per cent. Something more definite should be brought before them. Then, in the last paragraph, he said: "Given a supply of oil at 2d. to 3d. per gallon, &c." Really such a statement was too vague. There was a very large difference between the two prices; and if they were to adopt water gas, they must have some more definite proofs of its economical advantages than those given by Mr. Ogden. So far, however, he did not see that there would be any special advantage in the introduction of carburetted water-gas plant. It might be all right for managers who were in want of storage and retort-house room; but they should take care to have enough storage and retort capacity, then there would be no need to introduce water gas.

Mr. W. Carr said he must admit that he also was somewhat disappointed, after the author's excellent paper read at Leeds, to find that the present production was of rather a scrappy kind, and evidently written in a hurry. Amongst the unjustifiable conclusions arrived at by the author, was the statement that the 1½ candles lost through condensation in 17 days was no more than would be the case with ordinary coal gas. He might remark that he had never known such a loss with ordinary gas; and if this occurred with the gas standing absolutely quiescent, how much greater would be the loss when it was passing through small service-pipes, and with the consequent friction entailed during its passage. With regard to cost, Mr. Ogden had stated that water gas was produced at 1s. 2½d. per 1000 feet; but he might refer the author to a statement made that afternoon to the effect that ordinary gas could be made at 6½d. per 1000 feet. How then could water gas be the cheaper? Of course, where managers could not put in extra plant, and there was not enough retort-house room, water gas might serve, as well as in instances where there were sudden calls upon the supply. There was also much to be said for it as regards the better price obtained for coke. In ordinary cases, they had often to give the coke away; but with water gas, they could use half and sell the other half at the same price as coal.

Mr. S. Meunier said, with regard to the loss through condensation, he should like to know how the tests of the quality of the gas were made. In his own experience, he had found that when gas had been stored in a holder for a length of time, and then tested immediately it came out, the illuminating power had fallen very heavily—even as much as 1½ candles; but when it had worked through the mains, and was tested at the photometer bar, it was found that the loss was more apparent than real. He should like to know whether Mr. Ogden had given the gas time to circulate through the mains before testing. At a small works he had recently, in testing the candle power when the gas was first coming out of the holder, found that the illuminating power was only 16 to 16½ candles; but when tested after rapid circulation, it rose to 17¾-candle power.

Mr. J. West said that the Blackburn plant was certainly very admirable; but he understood it had been adopted more for convenience, and for its advantages as regards the disposal of coke and other matters, than any general saving in the price of the gas, which he did not think Mr. Ogden would claim for it. Personally, he had not been able to find out any special advantages in water gas. No doubt it was very convenient to produce a large volume of gas *instanter*, when a fog came on. But they must not "pay too dear for their whistle;" and if, as Mr. Newbigging had observed, they had sufficient retort-houses, &c., there would be no necessity for the adoption of water gas. If Mr. Ogden really did claim that water gas could be produced at less cost than ordinary gas, he (Mr. West) would challenge the statement.

Mr. Terrace asked if there was any increase or decrease of naphthalene in the mains since Mr. Ogden had introduced water gas at Blackburn.

The President said he had held the opinion that water gas would be 10 to 15 per cent. lower in heating power than ordinary gas; but he was obliged to the author for having cleared up the point. It would have been a serious matter, in such a place as Manchester, if people who used water gas for gas-engines, heating, cooking, and generally for any purpose where energy was required, had to be told that there was a loss of 10 to 15 per cent. in heating power.

Mr. Ogden, in responding, explained that stress of time had been accountable for the rough form in which his paper had been presented. With regard to liquid products in the mains, these were not present to any greater extent than in ordinary

coal-gas mains; and there was no naphthalene whatever. As to the question of how the tests of the quality of the gas were made, he might inform Mr. Meunier that the gas was tested on the bar photometer before going out; and the holder had been working about half an hour when the test was made.

Mr. NEWBIGGING moved a vote of thanks to the author; and it was carried.

The members then had tea together; after which several healths were proposed, including that of the President. Mr. Newbigging, who seconded this toast, observed that he had the honour of having introduced Mr. Carr to the gas profession. The toasts of "The Retiring President," and "The Secretary," were also proposed, and duly responded to; the intervals being filled up with songs.

PREVENTING THE FREEZING OF GAS SERVICE-PIPES.

Dr. J. Bueb, of Dessau, has carried out experiments in the Laboratory of the Imperial Continental Gas Association on some processes designed to prevent the stoppage of gas supplies in very cold weather; and he has communicated his results to the "Journal für Gasbeleuchtung." He has himself devised a process for admitting alcohol vapour in regulated amount to the gas-main; and he finds that the illuminating power of the gas is unaffected thereby, though the freezing up of the services is prevented. The alcohol is vaporized by steam or direct heating just before admission to the main; and the quantity is regulated according to the amount of gas passing per hour and the prevailing degree of cold. A table is provided for use with 95 per cent. denaturized spirit. Dr. Bueb made some experiments on Malam's process, which consists in subjecting the gas to cold, and subsequently passing it over alcohol. Naturally he found the greater part of the benzol vapour was removed from the gas; and though freezing was prevented, the illuminating power dropped by 48 per cent. He then tried the apparatus devised by J. E. Kearns, which was intended for local application only. Dr. Bueb's experiment was therefore made on a three-light service. The gas passed over the surface of strong alcohol, and then through a chamber in which condensed matters were deposited. The gas was then subjected to low temperatures; but the aqueous vapour did not freeze out. The illuminating power was, however, deteriorated by 22 to 36 per cent. at temperatures from 39° to 5° Fahr., through the separation of benzol from the gas by the alcohol. Both of these processes appear, therefore, only to prevent freezing at the cost of great loss in illuminating power. Dr. Bueb considers that processes which remove aqueous vapour from the gas by passing the latter over desiccating material are unreliable, as benzol will separate when the gas is exposed to great cold, and consequently the illuminating power will be deteriorated. He places Willson's calcium carbide process, recently described in the "JOURNAL" (see *ante*, p. 334), in this category. He claims that his process for leading vaporized spirit into the gas is free from the objections raised to the other methods; and it is now in use at 35 gas-works on the Continent.

A Lost Coal Seam Found Again.—It is stated that the broken end of the once famous Tillery seam of coal has been recovered at Abertillery, in South Wales. Some twenty years ago, this seam (which consists of red ash house coal, and was also thought highly of for the production of gas) suddenly came to an end; and the colliers in the advanced stall could win no more—a condition of things which, we believe, experts were powerless to advise upon or account for at the time. It is now claimed that the same seam has been struck again in the mine known as Abertillery Big Fault; the seam consisting of three layers of coal, 4½ feet in thickness, with 12 inches of rubbish between.

Lighthouse Illumination.—At the Imperial Institute on Monday last week, Mr. C. A. Kent, the Secretary of the Trinity House, delivered a lecture on "The Lights of the British Isles." The lecturer introduced his subject with a graphic description of the various kinds of lights in use in the lighthouse services of Great Britain and Ireland, from the comparatively feeble oil catoptric or reflector light up to the dioptric or lenticular electric light, having an intensity of many millions of candles. The advance made in the science of lighthouse illumination was, he said, considerable, as was shown by the fact that the chandelier of Smeaton's tower on the Eddystone was first lighted in 1759 by tallow candles of 67 modern standard candle power unaided by any optical apparatus; while the power of the beam from the present Eddystone tower was equal to 80,000 candles. The successive stages in coast illumination were wood fires, coal fires, candle lights, flat-wick lamps, circular-wick lamps of Argand, and concentric-wick lamps; and in them was burned first sperm oil, then vegetable oil, and finally mineral oil aided by reflectors and by lenses on the principle introduced by M. Fresnel. Later on gas took the place of wicks; and electric lights were the last stage of intense brilliancy reached in coast illumination. Mr. Kent concluded by saying that the whole of the lighthouses and the other sea marks of the United Kingdom were maintained out of a fund derived from light-house tolls, amounting to £500,000, and were therefore self-supporting.

CORRESPONDENCE.

[*We are not responsible for the opinions expressed by correspondents.*]

The Chartered Gas Company and their Residuals.

SIR,—It is very refreshing to see a shareholder in The Gaslight and Coke Company actually taking an intelligent interest in the affairs of the Company. From the letter of Mr. E. Todd in your issue for Feb. 25, this appears at last to be the case. I would suggest to Mr. Todd and other shareholders that they should insist on more businesslike management in dealing with all the Company's residuals. The cure is simple. They should insist that all the Company's residuals should be sold by tender. As far as the tar and liquor go, it is well known that there are at least two firms close to the works who are specially fitted, both as to skill and means, to deal with these. There are many others who could deal with portions, if the contract were divided up. Any money paid by contractors would be an asset to the shareholders. At present, no ordinary shareholder or outsider can say how much the tar and liquor are worth to the shareholders generally; but many shrewdly suspect that they are more a means of finding berths and salaries to officials than anything else.

Several years ago, my late father attended the general meeting of the Company and advocated proper separate accounts being published for the residuals; but the proposition was received with impatience. The fact is, the Company have old concessions and properties which have much appreciated in value, and provide large revenues independently of the way in which the current business of the concern is carried on. Consequently, it has been so difficult to get the proprietors' attention, that the "JOURNAL" once remarked that the ordinary shareholder in The Gaslight and Coke Company understood as much about the markets for his products as a fat sheep did of the market he was sold in. However, the coke matter, coming as a "last straw," appears to be waking some people up.

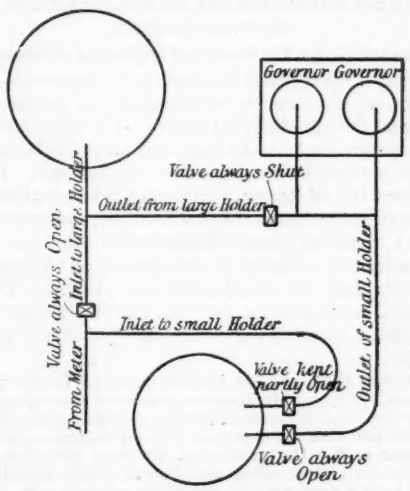
Is there a case in which the Company have managed well with a single bye-product? Look at the sulphate market—always depressed with the open knowledge of the heavy Beckton stock. Again, look at pitch. Let the shareholders read the case of *Stockman v. Dasnières* [reported in the "JOURNAL" for May 13, 1890], and see how some of their pitch was resold to them at a profit. Again, look at the Directors starting an elaborate process to manufacture prussian blue, without consideration as to whether the market would stand their output, and the fall in consequence of from 4d. per pound to 2d. or thereabouts.

I maintain that it would be better for the shareholders, for other gas companies, and for all the industries depending upon gas residuals if The Gaslight and Coke Company would sell their products by tender to fit and capable contractors.

Pye Bridge, near Alfreton, Feb. 27, 1896. J. F. KEMPSON.

A Single Pipe for Gasholder Inlet and Outlet.

SIR,—Respecting the inquiry by Mr. Campbell in the "JOURNAL" for Feb. 18, in regard to a single pipe to serve as inlet and outlet to a gasholder, I happen to have the very thing working my largest holder; and during my three years at Harlow I have not experienced any difficulty in the working of the arrangement (which is shown in the accompanying diagram), but rather the other way. I have two holders—one of 15,000 cubic feet, and the other (worked with the single pipe) of 30,000 feet capacity; and for the last six months I have



not altered either outlet-valve, as I keep the outlet-valve of the small holder always open, feeding it from the large one by just leaving the inlet-valve a trifle open. By this means it has not given me any trouble or anxiety; for, should I be absent, there is only one valve for the man to shut if the holder became too full, which is very seldom the case with me, especially at night. I find, moreover, that by working this way the gas becomes thoroughly mixed.

Gas-Works, Harlow, Feb. 27, 1896. FRANCIS H. WOOD.

The Reported Explosion at the City Gas-Meter Testing Offices.—With reference to the paragraph on the above subject which appeared in the "JOURNAL" last week, we learn that the explosion did not occur in the offices of the Inspector of Gas-Meters, but in a building in the immediate vicinity.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

The following progress was made with Bills last week:—

Bills read a second time: Aldershot Gas and Water Bill, British Gaslight Company (Norwich) Bill, Cheltenham Gas Bill, Cowes Gas Bill, Newcastle-upon-Tyne and Gateshead Gas Bill, Redheugh Bridge Bill, Ystrad Gas and Water Bill, Ystradyfodwg Urban District Council Gas and Water Bill.

Petitions have been presented against the following Bills: Birmingham Corporation Water Bill, Cowes Gas Bill, Drogheda Corporation Bill, Dublin Corporation Bill, Falkirk and District Water Bill, Malvern Link Bill, Manchester Corporation Bill, Ystrad Gas and Water Bill, Ystradyfodwg Urban District Council Gas and Water Bill.

HOUSE OF COMMONS.

The following progress was made with Bills last week:—

Bill presented, read the first time, and referred to the Examiners: Cupar Water Order Confirmation Bill.

Bills read a second time and committed: Barnsley Corporation Water Bill, Barry Urban District Council Bill, Bilston Improvement Bill, Brighton Corporation Water Bill, Burton-upon-Trent Corporation Bill, Chester Corporation Bill, Dewsbury and Heckmondwike Water Bill, Edinburgh Extension Bill, Huddersfield Water Bill, Kirkcaldy and Dysart Water Bill, Leamington Corporation Bill, London Sea Water Supply Bill, Matlock Bath Gas Bill, Rotherham Corporation Bill, Sheffield Corporation Water Bill.

On Monday, the 24th ult., Mr. J. Stuart moved to discharge the order committing the Lambeth Water and Southwark and Vauxhall Water (Transfer) Bills, and refer them to a Hybrid Committee. Objection was taken to this course; and the matter was thereupon adjourned till the 13th inst.

Petitions have been presented against the following Bills:—Barry Urban District Council Bill, Bexhill Water and Gas Bill, Bilston Improvement Bill, Bournemouth Gas and Water Bill, Brighton Corporation Water Bill, Burton-upon-Trent Corporation Bill, Chester Corporation Bill, East London Water (Height of Supply) Bill, Eastbourne Water Bill, Edinburgh Extension Bill, Fylde Water Bill, Guildford Gas Bill, Huddersfield Water Bill, Kent Water Board Bill, Kirkcaldy and Dysart Water Bill, Leamington Corporation Bill, London Sea Water Supply Bill, Matlock Bath Gas Bill, New River Company Bill, New River Water (Transfer) Bill, Porthcawl Water Bill, Portsmouth (Borough) Water Bill, Sheffield Corporation Water Bill, South Metropolitan Gas Bill, Southwark and Vauxhall Water Bill, Staines Reservoirs Bill, West Middlesex Water (Transfer) Bill, Whittington Gas Bill.

A petition was presented from Banbury for an alteration in the law in regard to District Councils' water supply.

LEGAL INTELLIGENCE.

HOUSE OF LORDS.—Monday, Feb. 24.

(*Before the* LORD CHANCELLOR *and Lords* HERSCHELL, M'NAGHTEN, SHAND, *and* MORRIS.)

Holme and King v. The Mayor and Corporation of Stockport.

The hearing of the appeal in this case was commenced to-day. The plaintiffs, a firm of contractors at Liverpool, had constructed a gas-holder tank for the defendant Corporation. The action was originally brought to recover the balance of amounts alleged to be due for work done—some portions of it being outside the contract. The matter was sent to the Official Referee, who decided in favour of the claimants on the three items in dispute. A Divisional Court reversed the decision with regard to all the items. Subsequently, the Court of Appeal decided unanimously in favour of the plaintiffs on two items, and on the third item there was a majority against plaintiffs. Under these circumstances, their Lordships were appealed to. The proceedings in the Courts below were duly reported in the "JOURNAL," Vol. LXIII., pp. 200, 532.

Mr. MOULTON, Q.C., and Mr. MORRIS appeared for the appellants; Mr. ASQUITH, Q.C., and Mr. BYRNE represented the respondents.

Mr. MOULTON having recapitulated the previous proceedings in the case, said the first item in dispute was £760 for damages arising through the Engineer to the Corporation at the time the work was done refusing to name a place where the plaintiffs could deposit the sand, gravel, or ballast excavated in the course of the work. The consequence was that they had to cart the stuff to a considerable distance; hence the claim under this head. Owing to this refusal to give them a place, they were obliged to cart it to one of their own providing.

Lord HERSCHELL remarked that in that case there would be a breach of contract by the Corporation.

Lord MORRIS: The soil belonged to the owner; therefore you ought to have left it on the ground.

The LORD CHANCELLOR said that, from this point of view, the contractors had no right to remove, because it was valuable material.

Mr. MOULTON maintained that the sums claimed were in respect of extra work, wholly outside the contract, which the appellants were called upon to do, and, in fact, did, after the respondents had been expressly told by the appellants that they were under no obligation to do it. With regard to the claim for about £400 for putting right a leakage in the tank which occurred after the completion of the works, but during the period of maintenance, the point was whether the work was done by the authority of the Corporation Gas Engineer (who was Engineer of the works in question), and was consequently an extra.

Lord HERSCHELL remarked upon the absence of evidence from witnesses whose testimony was material.

Mr. MOULTON, in answer to the Lord Chancellor, said the contention was that the defect in the tank was urgent, and had to be put right at once; leaving it to be settled afterwards whether or not the Corporation were to be liable for the work. The Referee (Mr. Gully) had decided that they were liable.

The LORD CHANCELLOR: To my mind, the whole point turns upon whether the leakage was due to bad work or to the original design.

Mr. MOULTON proceeded to read the judgments of the Courts below.

The LORD CHANCELLOR said he could not discover in the judgments any one finding whether the leakage was due to bad work or to the original design.

Mr. ASQUITH presented his case on the two items, and admitted that there were some matters of fact which ought to be sent back to the Referee for further inquiry.

The LORD CHANCELLOR, after their Lordships had consulted, said they were not in a position at present to give judgment. The majority of them were of opinion that the claim of £760 need not go again to the Referee; but with regard to the claim for £400, they thought it should be sent back, including the right of the defendants to damages for delay in completion of the works.

Lord MORRIS said he was of opinion that both questions should be sent back.

The case was accordingly referred back, and judgment withheld.

HIGH COURT OF JUSTICE—CHANCERY DIVISION.

Wednesday, Feb. 26.

(*Before Mr. Justice* CHITTY.)

Incandescent Gas-Light Company, Limited, v. Howard and Son.

This was an action for infringement of plaintiffs' patents, which came on as a short cause as a motion for judgment on admissions in the pleadings.

Mr. WALTER, who appeared for the plaintiffs, said it was alleged by the statement of claim that the plaintiff Company were the owners of the patents in question, the validity of which had been certified by Mr. Justice Romer in an action against the Deimel Light Company and Herr Hirschfeld;* and that the defendants had purchased from the plaintiffs mantles made in accordance with the patent, under the condition that they were not to be used in connection with any burner except those supplied by the plaintiff Company. This condition had been held to be binding by Mr. Justice Wills, in the action brought against Mr. Cantelo.† A defence had been put in; but the purport of it was merely that the plaintiff Company had no patent for their burners, and a complaint that the defendants should have been proceeded against instead of the manufacturers of the burners. There was, in reality, no defence; and, in fact, the defendants signed an express agreement to abide by the conditions before any mantles were supplied.

Justice CHITTY, having read the statement of defence, said there was no defence.

Mr. HOWARD (who appeared in person) said it was very hard that the Company should attack a small man like himself, when there were other large companies with unlimited capital who were doing the same as he did.

Justice CHITTY said a patentee was entitled to take proceedings against anyone he chose. If the defendant asked leave to withdraw his defence and put in another, he would listen to the application. But he could not advise him to do so; and it would, in all probability, only occasion him more expense to no purpose.

Defendant said he did not desire any postponement.

Justice CHITTY accordingly gave judgment for plaintiffs for an injunction with costs as between solicitor and client, and an inquiry as to damages, the costs of which were reserved.

Friday, Feb. 28.

The Meteor Incandescent Lighting Company, Limited, v. The Incandescent Gas-Light Company, Limited.

This was a motion for an injunction to restrain the defendants from threatening any person or persons by circulars, advertisements, or otherwise, with legal proceedings or liability in respect of the manufacture, sale, offering for sale, purchase, or use of gas-lights known as the "Meteor" incandescent gas-light, on the allegation that such manufacture, sale, offering for sale, purchase, or use of such gas-lights was an infringement of letters patent belonging to the defendants. The defendants have commenced an action for infringement against the plaintiffs in respect of the patents of 1885, 1886, and 1893, but not in respect of the patent of 1887, for "an improvement in incandescent gas-burners;" and it was asserted that such action was not brought *bonâ fide*, but merely by way of defence. Plaintiffs alleged that the letters patent, the subject of the action, were invalid for various reasons; and they asked that until the trial, or until after the action against the Sunlight Incandescent Gas-Lamp Company (which has been fixed for the 9th inst.) was disposed of, the defendants should be restrained from threatening their customers.

Mr. BYRNE, Q.C., Mr. BOUSFIELD, Q.C., and Mr. WALLACE, Q.C., appeared for the plaintiffs; Mr. MOULTON, Q.C., Mr. TERRELL, Q.C., and Mr. WALTER, for the defendants.

The arguments on behalf of the plaintiffs had not concluded when the Court rose, and the further hearing of the motion was adjourned until Friday next.

* See "JOURNAL," Vol. LXIV., p. 197. † *Ibid.*, Vol. LXV., p. 956.

BROMLEY PETTY SESSIONS.—Monday, Feb. 24.

(*Before Mr.* COLES CHILD, *Chairman, and a Bench of Magistrates.*)

The Quality of the Crystal Palace District Gas Company's Gas.

To-day the Crystal Palace District Gas Company were summoned by the Beckenham Urban District Council for having, on the 13th of January last, unlawfully supplied gas of less purity than it ought to have been according to the provisions of the Gas-Works Clauses Act, 1871, and the Crystal Palace District Gas Acts of 1873 and 1893; further, for unlawfully supplying, on the 18th of January, gas of less purity than it should have been according to the provisions of the Acts, and also for having supplied, on the 13th of January and six consecutive days, ending the 18th of January, gas which contained, on an average, a greater quantity of sulphur per 100 cubic feet than that specified in the Acts.

Mr. STEVENS appeared for the District Council; Mr. BLYTH, for the defendant Company.

Mr. STEVENS, having elected to proceed with the third summons, said that, under the Acts named therein, the penalty for a deficiency in respect of purity in the gas supplied by the Company was put at a sum not exceeding £20. His case was that, on the 18th of January, the Gas Examiner appointed by the District Council tested the gas at the Beckenham testing-station, and found it to contain 35·71 grains of sulphur per 100 cubic feet of gas.

Dr. *Samuel Rideal*, F.I.C., F.C.S., said he was Gas Examiner to the Beckenham Urban District Council. He made tests of the gas on the dates mentioned in the summonses; having given the Gas Company notice by telegram, on the 13th of January, of his intention to do so. The Company's representative was present when the first test was made. The result of the test made on Jan. 18 was that witness found 35·71 grains of sulphur per 100 cubic feet; and, after making the correction for temperature and pressure, the excess was 5·71 grains.

In cross-examination by Mr. BLYTH, witness said he was not a gas engineer, and did not know the condition of the Company's purifying plant. He was not aware of any case where the whole of the sulphur was taken out of the gas; but the London Gas Companies reduced it to a smaller amount than in this case. It depended entirely upon the quantity of lime used. Witness was then cross-examined as to the absence from many Gas Acts of provisions for dealing with the sulphur, and as to the absolute minuteness and unimportance of sulphur products

Mr. BLYTH said he was going to submit that, in the present instance, the excess of sulphur was due to an unavoidable accident over which the Company had no control. In all the tests of the Company's gas during the past five years, on only one occasion had the limit been exceeded, and then by but one grain. If he proved that the excess for which the Company were now summoned was unavoidable, or due to an accident, he should submit that there could be no conviction.

In further cross-examination, witness stated that probably the cause of the excess was the use of coal containing a large quantity of sulphur; or it might have been caused through the lime purifiers not being properly worked.

Mr. BLYTH said that, being unable to obtain their regular contract supply of coal, the Company, on or about the 13th of January, had to purchase four cargoes of a different kind of coal; and it was impossible to tell at once whether or not it contained more sulphur than it should do. He put it to witness whether, if the excess was caused in that way, it could be maintained that the Company were responsible.

Witness said he knew nothing about the Company's storage capacity; but if one pit was stopped, he thought they could have obtained a similar quality of coal from another.

Re-examined: He thought the matter resolved itself into a question of the price paid for the coal. During the particular week in question, the London Gas Companies produced gas with much less sulphur. He agreed that, if gas companies had no sulphur clauses in their Acts, they could provide cheaper gas.

Mr. BLYTH contended that the defendants clearly came within the provisions of the Acts providing that there should be no forfeiture where the excess of sulphur arose through unavoidable cause or accident. Dr. Rideal had admitted the extreme minuteness of the sulphur tests, and had acknowledged that they were not deemed of sufficient importance to be included in many Gas Acts. He (Mr. Blyth) submitted that, remembering these facts, the Company had done everything possible, and that they could only conjecture the cause of the excess as being due, either to a sudden variation in the temperature, or to the different coal they had to obtain owing to the stoppage of their regular supply containing a larger quantity of sulphur than could be ascertained at once. He therefore asked that the summons should be dismissed.

Mr. *J. C. Watson*, the Assistant Engineer at the Company's works, said the purifying plant was the best obtainable; and the quality of the gas was certainly watched and tested. During the past twenty years, there had only been two instances where the sulphur limit had been exceeded. He attributed the cause in the present case to sudden change of temperature. The Company's sulphur tests for the six days mentioned in the summons averaged 20·91 grains; this being well within the limit. The coal they had to obtain in consequence of a stoppage at the pit was different to that used by the Company regularly; and they were not aware that it contained more sulphur until they received the report as to the tests made by Dr. Rideal. Steps were then at once taken to reduce the sulphur compounds; but this required several days to accomplish. The removal of these compounds was an expensive operation; and, in witness's opinion, it entailed unnecessary cost. The Company paid about £3000 a year for purifying their gas; while at Bromley hardly £50 per annum was spent for this purpose. He looked upon this expenditure as needless waste of money. He concurred in the opinion which had been expressed that, if the sulphur clauses were repealed, gas could be produced and sold at 2d. per 1000 cubic feet less than at present.

The CHAIRMAN said the Bench were of opinion that the Company had infringed the provisions of the Acts of Parliament; and they therefore imposed a fine of £5, with £5 5s. costs.

District Councils and Private Water Supplies.

At the Highgate Police Court on Monday last week, Elizabeth Gooday, residing at Whetstone, was charged, on a summons taken out by the Friern Barnet District Council, with having wilfully obstructed a person duly employed in the execution of the Public Health Act, 1875. Mr. Goodship, the Clerk to the Council, prosecuted; Mr. Forbes defended. It appeared that for some time past the Council, as the local authority, had, under section 62 of the Public Health Act, been endeavouring to compel Mrs. Gooday to lay on a supply of water to her premises from the mains of the Water Company. Mrs. Gooday refused to do so, having, as she said, a "good supply" from other sources. The Council's notices not being complied with, officers in their employ were sent to do the work of laying on the water. But Mrs. Gooday refused to permit them to enter her premises; and this was claimed to be "obstruction" within the provisions of section 306 of the Act. Mr. Goodship also contended that the Council had no need to take the preliminary step of getting a Magistrate's order for the work to be done before they undertook it themselves. Mr. Forbes submitted that Mrs. Gooday had not been guilty of any offence. The Bench were quite satisfied that a local authority could not, against the will of an owner or occupier, force an entrance until they had obtained a Magistrate's order to sanction this course. In this case the Council had not obtained such an order; and therefore the summons must be dismissed. Mr. Goodship asked the Bench to state a case for the High Court; and this they consented to do.

Fatal Accident at the Eccup Reservoir of the Leeds Corporation.—A timberer, named John Simms, was following his occupation yesterday week at the Eccup reservoir of the Leeds Corporation, when a quantity of shale, which some other workmen were hoisting, broke away and hurled him to the ground, inflicting injuries which terminated fatally.

Mechanical Retort-House Appliances for the Leeds Gas-Works.—The Sub-Committee of the Gas Committee of the Leeds Corporation who have the management of the New Wortley works had under consideration last Wednesday the question of introducing mechanical appliances into the retort-houses at the station. After some discussion, they unanimously decided to ask the Gas Committee to recommend the Council to accept tenders that have been sent in by Messrs. William Arrol and Co., of Glasgow, and by West's Gas Improvement Company, Limited, of Manchester, for the supply of the machines; the two tenders amounting to about £12,000. At present there are, roughly speaking, 200 stokers engaged at these works; and if the system is altered as proposed, only about 60 of these men, it is stated, will be required. The men who would be thrown out of employment will, however, have the first chance of work in the new wing of the Meadow Lane station. On Thursday, the Gas Committee confirmed the Sub-Committee's minutes referring to this matter.

The Deficiency on the Teignmouth Gas Accounts.—Further consideration was given by the Teignmouth District Council, at their meeting last Wednesday, to the question of the deficiency in the gas-works accounts. The Gas Committee recommended that from Lady Day next the charge for gas supply to the public lamps should be increased to £700 per annum. A statement as to the income and expenditure of the department showed that the liabilities amounted to £1624, and there was a balance of £284 due to the Treasurer; while against these was the sum of £563 outstanding for gas-rentals. In answer to a question as to the manner in which the cost of public lighting was arrived at, it was explained by Mr. Harris that the total consumption of gas in the street lamps was 4,112,500 cubic feet per annum, which, at 3s. 6d. per 1000 feet, amounted to £712 per annum, or, in round figures, £3 per lamp per annum. Objection was raised to the increased charge being applied to Shaldon; and it was urged that the price should be increased to private consumers. Replying to further inquiries, Mr. Harris said the balance-sheet for last year had not been prepared yet; and the Committee had done nothing with a view to getting out of debt beyond the increase of £100 in the charge for public lighting. Mr. Jarvis said that would not pay off £2000; and at the next meeting he should move that the price be increased to the private consumers.

Modern Gas Manufacture.—Under this title, Mr. G. E. Brown, F.C.S., delivered a lecture at the Wolverhampton Free Library, on Saturday, the 22nd ult. Mr. J. S. Reeves, the Engineer and Secretary of the Bilston Gas Company, presided. After briefly alluding to the historical circumstances connected with the adoption of coal gas as an illuminant, the lecturer proceeded to detail the history of coal, and describe the *rationale* of its carbonization. Dealing with the practical details of gas manufacture, a description was given of the ordinary and gaseous methods of heating retorts. Mr. Brown illustrated his remarks throughout with a series of lantern slides. The subject of charging and drawing the retorts, and the great advances made in mechanical chargers, was next referred to; and a number of slides were shown to demonstrate the advantages of the inclined retort system. Following the gas through the process of purification, Mr. Brown reminded his audience that gas only forms about 15 per cent. of the total products obtained from the distillation of coal, and that the others—viz., the coke, tar, and ammoniacal liquor—were materials which, by their further utilization, would enable gas to keep abreast of other systems of lighting as far as cost was concerned. The removal of these products was explained, and the course of the gas pursued to the holder. The construction of telescopic gasholders was next touched upon. After alluding to the fact that the illuminating property of gas depends upon the presence of about 4 per cent. of unsaturated hydrocarbons, the lecturer proceeded to describe the various types of burners and their respective advantages. Through the courtesy of the Wolverhampton Gas Company, a series of burners had been fitted up on the platform by Mr. A. Combs, the Manager of the local fittings department. The use of gas in gas-engines was illustrated by experiments; and the latest application of these motors for drawing tramcars was explained. Mr. Brown concluded by alluding to the uses to which the bye-products of gas-works are applied. He received a hearty vote of thanks.

MISCELLANEOUS NEWS.

CHESTERFIELD GAS AND WATER WORKS ARBITRATION.

Surveyors' Institution, Westminster.—Friday, Feb. 21.

(*Before Sir* GEORGE B. BRUCE, *Umpire.*)

On the resumption of the proceedings this morning,

Mr. *Hill*, in further cross-examination, said he thought 24 years' purchase was fair, considering the "prospective depreciation" shown on the tables he had prepared. They only went down to the year 1902, when starvation point—that at which only about ½ per cent. would be earned—would be reached. As to there being any increase in the profit after 1902, they had to consider the fact that the Company were now supplying 48,000 out of 51,000 inhabitants. If the population increased, the profit might also increase; but he did not see where the additional population was to come from. By the year 1902, the Company would have secured the supply of water from Hipper, which would amount to about 535,000 gallons a day—making, with the present supply, a total of 1,363,000 gallons available daily; but even then, taking the daily consumption per head at 20 gallons, there would be too little for a population of 70,000. No addition to the present supply could be obtained without spending £126,000. If the supply of Brimington were discontinued, it would increase the quantity available for Chesterfield. If reasonable terms could be arranged with reference to cutting off Brimington, this would solve the difficulty regarding Chesterfield. From 1880 to 1893, according to his tables, the average increase of profit on the water section of the Company was £100; but this sum would be reduced in succeeding years by £20 a year—the interest at 4 per cent. on £500, which would have to be expended yearly on pipes, &c. in order that the Company might continue to earn this increase.

Re-examined: He did not know that although the Brimington authority had power to supply water, they had no reservoir; nor did he know that they were short of water.

Mr. LITTLER quoted from the evidence given by the Chairman of the Chesterfield Company before the Parliamentary Committee, to show that the Chairman was opposed to Brimington being lopped off from the district supplied by the Company.

Witness (continuing) said he knew of no town where the supply of water was 15 or even 18 gallons per head per day. The Water Commission, of which he was a member, fixed the supply for London at 35 gallons per head per day; and the actual consumption was 32½ gallons. He had not sufficient local knowledge to say whether the quantity of water sold by meter was any indication of the amount used for trade. At Dewsbury, the general consumption was 40 gallons per head per day—13 or 14 gallons for trade and 25 or 26 gallons for domestic purposes. In April, 1895, he was told the reservoirs at Chesterfield were full. They held 160 million gallons; and at the end of October or the beginning of November—a period taken at 214 days—they were empty. Taking the storage at 150 million gallons, and dividing it by 214, they had a daily supply of 700,000 gallons, or about 14⅜ gallons per head per day for a population of 47,600. To this, they had to add the rainfall between April and November. The rainfall in this period over the 1333 acres area of drainage, was 14⅜ inches; and, supposing the quantity secured was about 3 inches of that, 422,000 gallons daily must have been obtained in addition. This, added to the 700,000 gallons already available, would increase the supply per head per day to 23½ gallons, which quantity must have been actually consumed. Towards the end of the time, he knew the Company were giving a short supply.

Mr. LITTLER: So far as you can see, there must have been at least sufficient water going through the reservoir to supply 23½ gallons a head per day?

Witness: Yes; the loose point in the calculation is as to the 3 inches rainfall on the area of drainage.

Three inches is a very moderate estimate, is it not, on a period of 214 days?—It is a very difficult thing. If the rain fell heavily, there would not be much loss from evaporation; but if it fell lightly, the evaporation would be more. The consumption in the summer months is always larger than in winter.

In reply to Mr. CRIPPS, witness stated that the whole supply in the dry season of 1895 was 1,123,000 gallons a day, which, supposing the consumption were 20 gallons a head, would be sufficient for the population of 56,000. Taking the consumption at 20 gallons, and knowing that there were 1,123,000 gallons a day available in the dry season of 1895, it would not cause him to modify his tables; because he should recollect that the consumption, put at 20 gallons daily, was not correctly stated. He should say the figure ought to be 25 gallons. As to ceasing to supply Brimington with water, and thus increasing the amount available for Chesterfield, he pointed out that if this were done the income derivable from that source would also disappear. The figure of 20 gallons a day was adopted by witness because Mr. Hawksley and others had taken it; but the tests he had applied showed that the actual consumption last year was over 23 gallons per head daily.

Mr. *W. B. Bryan*, M.Inst.C.E., Engineer to the East London Water-Works, and formerly Engineer to the Blackburn Corporation, stated that he should place the consumption of water of a place like Chesterfield at 25 gallons per head per day. Under no circumstances should he recommend the carrying on of a concern only capable of delivering 18 gallons a head daily to the persons in its district of supply. Even 20 gallons was too small a quantity, as the tendency was for the consumption, with improved sanitation, to increase. He saw the reservoirs on Nov. 19 last; and they were so low that the water was unfit for use. In his opinion, the Company ought long ago to have provided for a continual supply. The Company, having regard to all the facts, were not in a position to claim the same number of years' purchase as if they were fully equipped and well administered. He had consulted with Mr. Hill on the case, and agreed generally with his evidence.

In cross-examination, witness said that, supposing Mr. Hill was right as to the available resources of 1,123,000 gallons over 214 days, this gave a supply for a population of 56,000 at 20 gallons a day. But it must be remembered that at the end of the 214 days the reservoirs were empty, that the supply had been short, that there had been complaints, and that the Company could not have gone on supplying even 18 gallons a day. It would hardly be possible to have a more severe test of the capacity of a water concern than the dry season of 1895, following the frost; this was found to be so even in East London, where the supply was reduced to 29 gallons per head daily. He thought the price of the shares in the market was some test of the value of an undertaking.

Mr. CRIPPS: Supposing you had been told that there were sales of shares in the Company at the rate of 26 years' purchase, would that lead you to give only 24, or less?

Witness: As a broad principle, no. Witness added that, as to the rating, on the supposition that the rates were the same in Chesterfield as in London, he still thought it was unprecedented that they should amount to 15 per cent. of the income.

In re-examination, witness gave it as his opinion that if the Company thought they were over-rated, it was gross mismanagement to allow themselves to be so treated, as they had done for 15 years, without appealing.

Replying to Mr. WOODALL, witness said that, in judging the quantity water-works could supply, one must take a very considerable period. In one part of England, a storage capacity of 150 to 180 days' supply might be sufficient; while in another part, as much as 240 days' supply would be required.

Sir F. BRAMWELL: Have we had it before us as to what is the capacity of the reservoirs with regard to available rainfall?

Mr. CRIPPS: I do not think we have.

Witness: The upper reservoir is of much greater capacity than the lower one in proportion to its gathering ground.

Mr. CRIPPS, in regard to the amount of the rates in Chesterfield, said in 1895 they were 6s. 3d. in the pound, and in 1894, 7s. 2d.

Mr. *Eaton* was then recalled with reference to the water supply of Brimington. He made a report on it in 1892; and he now confirmed statements which he had made before the Parliamentary Committee, to the effect that the supply of the Rural Sanitary Authority was miserable, that not without considerable delay could even the present district of the Sanitary Authority be supplied adequately, and that to do so they would require a reservoir of 70 million gallons capacity.

Mr. *Thomas Fenwick*, M.Inst.C.E., of Leeds, said he had had considerable experience of water-works and in arbitrations as to their transfer. He had made an estimate as to the value of the water portion of the Chesterfield Company's undertaking. He accepted £5221 as the net profit in 1894. Mr. Hawksley, in his estimate, proposed to add to that £412 in respect of what he called the excessive payment of rates. Witness, however, thought the Company had no right to make any such addition to increase their available revenue for the purpose of increasing the capital value. From the £5221, he deducted the interest on the mortgage debt attributable to the water section—£281—which left £4940 as the divisible profit for the year 1894. This profit was derived from supplying 47,590 people—the number of the whole population of Chesterfield. In witness's opinion, the proper amount of water to be allowed for a place like Chesterfield was 20 gallons a head per day; and in all his experience, he knew of no place where the supply was less than this. Taking this figure—which was the one adopted by the other side—the available water at Chesterfield at the present time was sufficient for 41,500 people. Working this out, he arrived at the conclusion that £4308 was the maintainable profit—not £5100 as calculated by Mr. Hawksley. This £4308 was the amount to be capitalized; and, in arriving at the proper multiplier to apply to the figure, they had to consider the present position of the Company, their power to supply the district, and that, at present, they were not able to fulfil their statutory obligations. They could not give a proper supply to the district until a new reservoir was built, and other works provided. When they had constructed these works, the Company would only receive a small additional sum; and the new income would be burdened by the interest on the money they would have to pay to construct the new works. In the last five years, the increase of profit on the water portion had been about £146 per annum. He thought that 24 was the proper number of years' purchase to take; and on this basis, the value of the water section would be £103,392.

In cross-examination, witness said that if a portion of the present district supplied were transferred to the Rural Sanitary Authority, thus increasing the available supply of water for the remainder, that would lead him to allow a greater number of years' purchase—30 years—of the net revenue. He believed Brimington (the portion it was suggested should be transferred) was productive to the Company of about £800 a year. If a new reservoir had to be constructed, no revenue would arise from it until complete.

Re-examined: At the present moment, there were 6000 persons in the district of the Company whom they could not supply with the full amount of water. The population of Brimington was 4000; so that, even if Brimington had not to be supplied, the Company would still be in great straits. If the Brimington supply were cut off, he was still of opinion that the Company would not be fairly entitled to 30 years' purchase.

Mr. *E. Tuckwell*, a member of the London Stock Exchange, stated that he had had considerable experience of buying and selling shares of gas and water companies; and in cases where companies combined gas and water businesses, he found that their shares were cheaper than when they dealt with either gas or water alone.

Mr. LITTLER: What do you say a fair provincial company ought to pay you per cent., water and gas, or water alone?

Witness: Water alone ought to yield about 4 per cent.

Water and gas?—I should think about 4¾ per cent.

Suppose you found a company with a capital of under £100,000, on which they paid 5⅛ per cent., announcing that they had to expend £126,000 further, spread over five years, before they got any increase of profit, and then that they would only earn 2 per cent. on the expenditure, what would you advise a client to buy stock at—to pay 4 per cent.?—I would not advise him to buy at all.

In cross-examination, witness said his experience was not very great regarding provincial gas and water companies. He had a Sheffield share list, according to which Chesterfield £10 shares, paying a dividend of 5⅛ per cent., stood at 16⅛, which would return 3¼ or 3⅜ per

cent. net. He had not had much to do with arbitration cases, and was only asked to attend the present inquiry that morning.

Mr. CRIPPS: What are the big London Water Companies paying now?

Witness: About 3¼ per cent.

What about 20 years ago?—I should think 3¾ to 4.

Can you give me any water company which 20 years ago only paid 4 per cent. on its ordinary shares?—No, it is so long ago.

Witness, in further cross-examination, said that he should think The Gaslight and Coke "A" stock would return now about 4⅜ per cent. It was matter of notoriety that securities had gone up of late years in consequence of money being cheaper.

Re-examined: Since the water question (by which witness was understood to mean the proposals for the taking over of the Companies' businesses by the municipal authorities or government) had arisen in London, the price of shares in these undertakings had risen considerably—that was generally the case when it was supposed a concern was going to be taken over. As to the 16½ quoted for Chesterfield gas and water shares, knowing what he had learnt that morning, he should say the price was being kept up for ulterior purposes; and in that case, it would be of no value as indicating the worth of the shares.

Mr. *E. H. Stevenson*, M.Inst.C.E., stated that he had examined the works at Chesterfield and made a valuation, which was the same as that of Mr. Hill. He could not believe Mr. Hawksley's statement that the deficiency in 1893 or 1895 was only 28,000 gallons a day, as this deficiency would not have occasioned anything like the scarcity that there was. The quantity in the reservoirs could have been measured as it went out. Under the conditions of 1893 and 1895, the deficiency must have been much more than 28,000 gallons a day; and witness drew the conclusion that the consumption of water in the town was much larger than was estimated. If the information given him was correct, he was sure the cutting off of Brimington would not leave sufficient water to supply the remainder of the population in the district. There were only some 200 houses and 1000 inhabitants in Brimington. Considering the water, the reservoirs, and the rainfall, witness thought the consumption at Chesterfield must be about 22 or 24 gallons a head daily. He had, however, for the purposes of this inquiry, taken the 20 gallons agreed upon in 1894. He did not think the rates and taxes paid by the Company were high; and he saw no reason for reducing them. He had placed the number of years' purchase at 24, chiefly in deference to the opinions of Mr. Fenwick, Mr. Bryan, and others; but he was sure no purchaser could be found to give that price for the concern. The 33⅓ years' purchase placed on it by the Company's valuers was more than could be obtained for debenture stock of the London Water Companies. No allowance for compulsory purchase should be made in this case, because the Company offered to sell the undertaking when before Parliament.

Mr. LITTLER at this point informed the Umpire that this closed his case as regarded the water portion of the Company's business. The witness would now give evidence regarding the gas undertaking.

Witness then proceeded to state that he had visited the gas-works, and had gone into the past history of the Company. Up to 1870, the Company had a reasonable capital—£28,000, or £592 per million cubic feet of gas made. The usual course was to give the capital per million cubic feet sold; but the Company were only able to state what they had made. In the eight years from 1870 to 1878, they increased the capital to the enormous sum of £59,690; and in 1894, the figure was £92,446, which was equivalent to £1657 per million feet made. As a consequence, they had been obliged to charge their maximum price. The capital per million cubic feet made of an undertaking the size of the Chesterfield one, should be about £560—not £1657. New land was purchased in 1870; and in 1873, the gasholder and purifier-house were commenced. The gasholder was completed in 1875; and, practically, from that day to this the sale and manufacture of gas had hardly increased. From 1869 to 1877, the gas made increased by 2 per cent. per annum on the average; and from 1877 to 1879, it was 1 per cent. There was a slight decrease in 1880; then a very rapid decline, followed by a rise in 1894 to about the level of 1876. In witness's opinion, the increase of 2 per cent. warranted nothing but the very smallest expenditure on capital account. The retort-house which the Company also erected had never been put into use. It was capable of making about a million cubic feet of gas daily; but the greatest consumption was only 330,000 feet in one day. The purifiers erected in 1870 were even now 150 per cent. too large. He did not think that the works had been kept in a proper state of repair. Some of the old buildings were absolute ruins; and the Company had not even taken the trouble to remove the wreckage caused by the explosion of their sulphate apparatus. It was admitted that they had not allowed sufficient for maintenance and repairs. In 1894, the amount was 1·84d. per 1000 cubic feet sold. Witness thought it should be 5d. in works of proper size; but the Company's works being so much larger than required, he should place it at 6d. This was 4·16d. above the amount spent by the Company; and he contended it should be subtracted from the profit of that year—making a difference of £925. In proportion to this capital, the Company were not more highly rated than was The Gaslight and Coke Company; and he knew the latter Company had no intention of appealing. Even if the rating were wrong, the Company had paid it for 15 years. When the amount was fixed in 1880, the new works had just been finished. In arriving at the rateable value of works of this kind, sometimes the value of the works and sometimes the profit was taken as a basis. He knew works that were earning no profits that were rated. He did not think any addition ought to be made for excessive consumption of coke for fuel; it was not more excessive than in other cases. The Company received 4·8d. per 1000 cubic feet sold for coke; whereas the average was 4·2d. Witness also objected to a similar addition in respect of the high price obtained by the Company for tar at Chesterfield. A number of large gas consumers had within the last few years installed the electric light, partly because of the absence of pressure and of illuminating power in the gas, and very largely because of the extraordinarily high price. Within the limits of the supply of the Chesterfield Company was the Whittington Gas Company, which was not statutory at present, but which supplied gas at 3s. 3d. per 1000 feet over a very scattered area. Mr. Jones had said he would lower the price of gas at once by 3d. per 1000 cubic feet if he were the Company; but witness thought this would not be sufficient. In foreign companies—particularly in South America—the public lighting, if not larger than the private, was a considerable proportion of it; and in English companies, it was usually 6 or 7 per cent. of the private lighting. In Chesterfield, the public lighting was 25 per cent. of the private lighting—a most unheard of thing—and the private lighting was considerably less than it was in 1880, the first date when it could be ascertained. These extraordinary proportions indicated that the Company were not making progress, but were going backward. From 1881 to 1891, although the population increased, the demand for gas decreased. If the Company were to go on, he thought it was necessary that they should reduce their charge by at least 1s. per 1000 cubic feet. Taking, however, the reduction at 6d., which in 1894 would have amounted to £1331, and deducting it, together with the £925 for repairs and renewals, from the sum they agreed upon as the profit for 1894, they had £2294 as the maintainable profit. Witness then went through calculations to show that the capital of the Company was excessive; and he pointed out that, although a profit of 8·8d. on every 1000 cubic feet of gas sold would be sufficient to pay the maximum dividends on the amount of share capital which he said was proper, as a matter of fact they made 21·88d. on every 1000 feet of gas—with which, of course, they paid their present dividends on the excessive capital. Mr. Jones and Mr. Hawksley had based the claim in respect of future issue of capital on the assumption that there would be a continued increase at the rate of 5 per cent. per annum in the consumption of gas, and, further, that the Company had the capital to issue. Witness, however, held that the first assumption was disproved by the past history of the Company, and by the fact that it was not at all likely that the use of gas would increase while the present prohibitive prices were maintained. As to the second point, the whole of the unissued capital was required to construct new water-works. The claim of the Company, in short, really amounted to 51 years' purchase of the agreed net profits of 1894. Such an extravagant claim, he had never heard of.

Mr. CRIPPS, before proceeding to cross-examine the witness, asked him to hand in the document to which he had referred in giving his evidence.

Mr. *Stevenson* declined, stating that the document was his proof.

Mr. CRIPPS and Mr. BRAY then asserted that they had a right to see the document, and Mr. FITZGERALD, in the temporary absence of Mr. Littler, supported Mr. Stevenson in his objection. Discussion ensued; and eventually an appeal was made to the Umpire, who said it seemed to him that Mr. Cripps ought to have the document. Mr. Stevenson then said he should only give the portion relating to the gas part of the business; he should absolutely decline to give up the remainder. Mr. Cripps demurred; but the Umpire ruled that the water portion of the case was closed. The witness thereupon handed Mr. Cripps the part referring to the gas section.

Mr. CRIPPS: Is there anything in your evidence in the proof relating to water which contradicts the evidence you have given to the Court?

Witness: No.

Mr. CRIPPS (referring to the document as to the gas which had been handed him): The first thing I look at—I presume the figures put in in type were the figures you first of all had before you?—Yes.

I will take page 14. I see you have there as the net maintainable profit, not £2994, but £3000?—I admit it. I altered the proof, I may say, in consequence of the evidence of your own witnesses; otherwise, if our side had gone in first, I should have delivered the proof not knowing the facts of the case.

Then the evidence you have given is not the evidence you arrived at when you first considered the case?—No.

Mr. CRIPPS: Then I ask you no other question.

Sir GEORGE BRUCE: There is such a thing as a witness changing his views.

Mr. FITZGERALD: As my friend does not cross-examine as to gas, I think it is a matter as to whether I should call any other witnesses. I must take Mr. Stevenson's evidence as accepted.

Mr. LITTLER, pending whose arrival the proceedings were adjourned for a short while, supported the action of Mr. Fitzgerald, and suggested that Mr. Cripps declined to cross-examine Mr. Stevenson on the ground that he was not to be believed—an issue which he (Mr. Littler) took with a light heart—or that his evidence could not be answered.

Mr. CRIPPS said that he declined to cross-examine, because Mr. Stevenson's evidence was unreliable, and differed considerably from his original views. As to Mr. Littler not calling other witnesses, he should suggest that this was because he could not find witnesses who took the same view as Mr. Stevenson.

Further statements followed, in which Mr. Littler announced his intention to adhere to his resolve to call no more witnesses. Mr. Cripps then asked permission to put in evidence as to the average rates and taxes of the district; but Mr. Littler objected to this, and the evidence was not given.

Sir GEORGE BRUCE then said it was perfectly usual and natural for a witness to alter his evidence in the course of an inquiry; and it was no reflection on Mr. Stevenson, that the evidence given was not what it might have been before.

Mr. CRIPPS disavowed any intention of casting a personal aspersion on Mr. Stevenson.

Mr. *Stevenson* stated that he had not felt hurt at all by what had been said about him.

The proceedings were then adjourned till the following Tuesday.

Tuesday, Feb. 25.

Mr. LITTLER to-day addressed the Court on behalf of the Corporation. He said that he had in his previous speech dealt with all that Mr. Cripps had said in opening, as to statements which he (Mr. Littler) had made when the Bill of the Company was in Parliament. He had made it abundantly clear that the Committee of 1895, in their decision, did not put in a word as to compulsory purchase; and he should disregard entirely what might have been said in the irregular

conversation which always followed the giving of a Parliamentary Committee's decision. The Corporation were compelled to buy, simply because residents in the town had risen in arms against the condition of the water supply. It was evident that a district so heavily burdened with rates as Chesterfield was, would not have gone into a large scheme of water supply but for the wretched mismanagement of the Company—a thing which he could say with safety, as every one of the Company's witnesses had assumed that all sorts of improvements must be effected if the concern was to go on satisfactorily. And although the Corporation only wished to purchase the water portion of the business, Sir James Kitson, the Chairman of the Parliamentary Committee, held that they should buy the whole; and he therefore made it a compulsory purchase—not a compulsory sale. When a sale took place under the Lands Clauses Act, there was no rule, Mr. Littler asserted, which said that a halfpenny should be paid for compulsory purchase—it was only a habit into which Arbitrators had fallen. Therefore, even if Mr. Cripps could establish that this was a sale under that Act, it did not at all follow that money for compulsory sale should be given. The Company went to Parliament for powers to borrow more money, although they had a large amount of unissued capital, on the ground that unless that were done they would not be in a fair position in case of sale to the Corporation. But this power was deliberately refused; Sir James Kitson remarking that the Company ought only to have a fair price for their business as it then existed. This seemed to end the question; the Corporation were to buy not what the Company might have had if Parliament had given these powers, but what they had when Parliament had refused them. The Corporation simply had to pay fair and reasonable terms. The Company confessed that they could not go on without an increase in the price of water of from 60 to 190 per cent., which was so enormous that it was incredible any Parliamentary Committee would sanction it in connection with a poor place like Chesterfield. But even supposing they had obtained this increase, the Chairman of the Company had told them that some £126,000 would have to be expended over a period of five years, in order to make the supply sufficient; and the effect on the dividends would be that they would be reduced from 5¾ or 6 per cent. to 2 per cent. or less. During the five years there would be no return at all; and after that time, he could not see where any increase was to come from, because there were only 55,000 people in their district at the present time, and of this number they now supplied, in an inadequate way, 48,000. There was thus only a balance of 7000. Of these, some were supplied by wells; while the remainder were for the most part of the poorest class—which meant, of course, that even if they were secured the consequent profit would be small. It was contended that the town was going to increase; but the same thing was said when the new gas-works were constructed. The increase, however, had never taken place; and it was an absolute fact that less gas was used now than when the works were erected. He could not see where any increase was likely to come from. Continuing, he pointed out how the witnesses on the other side had "tinkered" with the figures. They said the Company had been wrongfully paying enormous rates for the last 15 years. That might be so; but was the Court going to try a rating appeal? Witnesses had contended that the rating was excessive; but he thought it was fair. It had been laid down over and over again that it was not profit, but property, that was rated—in fact, a man still had to pay rates, even if "making a loss." In rating gas-works, their structural value and rent were the basis of assessment; and it had been decided that if people provided for the future by erecting works, they had to pay for them just as if they were used. Therefore they had the best possible reason why the Company had been rated so highly, and why they had not appealed—the simple reason that the works were worth the assessment.

Sir F. BRAMWELL: If you were to refrain from using the buildings?

Mr. LITTLER: If you were to absolutely close a building, I take it that the Court of Quarter Sessions would hold that it was not rateable; but to illustrate how far the law goes in the other direction, if a man has an empty house and stores furniture in one room, he is rateable for the whole of the house. If he closes the house—absolutely shuts it up—he is not liable.

Mr. CRIPPS: As regards the figures, it is another matter; but on the law of the question, I do not think there is any issue between us.

Mr. LITTLER (continuing) said the Company had never really attempted to raise the question of the rating; and if they did, they could not succeed. He had had taken out the capitalized value of the Company's witness's reduction of rates, with the 10 per cent. for compulsory sale added. In the case of the water section, it amounted to £15,106; and, as regarded the gas portion, it was even more startling —£38,247, or a total of £53,353, which was to be paid in respect of an assumed reduction which could not occur. Just as the rating had been changed for the advantage of the Company, so everything else had been altered. In 1894, when before Parliament, Mr. Hawksley said that the Company had a supply of 800,000 gallons daily; and that, taking 20 gallons per head per day, this was sufficient for 40,000 people. Now he had reduced the figure to 18 gallons a day. Obviously it was not right to have one figure for Parliament, and one for the purposes of arbitration. As a matter of fact, the consumption, whatever it was, was likely to be increased by reason of the extra water which would be required for the closets which the Corporation intended should in future be placed in the houses. Mr. Hawksley further stated that the divisible profit in 1894 was derived from the supplying of a population of 47,900; but the existing water-works were only capable of maintaining in a period of drought a supply of 18 gallons per head to 46,029 people. So even now there was a shortness of water for the present population. The expenditure of £126,000 was therefore necessary; and as this would reduce the dividend to 2 per cent., the Company certainly could not claim the full number of years' purchase. With the allowance for compulsory sale, the Company asked 36 years' purchase, although no one would dream of putting the number at 33, when they considered that Mr. Hawksley's table, if placed before the Local Government Board, would instantly produce an order that the Company were neither able nor willing to supply sufficient water, and therefore that the Corporation could immediately construct works of their own, and compete with the Company without further ado. The learned Counsel then quoted at length from the evidence of Mr. Hill and Mr. Fenwick, to controvert that of Mr. Hawksley, and in support of his contention that 20 gallons per head was the minimum daily allowance that ought to be provided. The actual net income from the water section was £4940, for which the Court was asked to award 38·4 years' purchase—considerably more than one would have to pay for the stock of a good London water company or of a good railway. Turning to the gas section, Mr. Littler said that all the argument he had used in regard to compulsory sale in connection with the water undertaking applied *a fortiori* to the gas. The true earnings of the gas-works for 1894, after deducting mortgage interest, were £4550, which was an agreed figure. Mr. H. E. Jones had, however, corrected it up to £6059, by the calculations contained in his evidence; and then, on the ground that the gas portion was paying maximum dividends, he had put the number of years' purchase at 28·57, and wished to add the allowance for compulsory purchase. But the Company were not justified in declaring these dividends, because they were not earned. Besides, there was this great difficulty—the gas and water sections were indissolubly wedded. If he (Mr. Littler) were right in contending that the water undertaking was declining—as it must decline—neither gas nor water could ever attain their maximum, because the dividend was not declared on gas stock separately from water stock, or *vice versâ*, but was declared on the same stock; and the small dividend on one stock would affect the other. It was merely the expenditure that was ear-marked. There would shortly be an aggregate capital of £300,000 on which to pay dividends; and as the maximum dividends could not be paid, the full 28·57 years' purchase could not be allowed. As regarded the mortgage debt of £6750, Mr. Jones proposed to convert it into capital, and thus increase the profit by £376; and though the operation was only imaginary, he had capitalized it, and claimed £10,742 in respect of it. The mortgage debt was raised under the Acts of 1855 and 1865; and there was considerable doubt as to whether the capital issued under these Acts could be converted as proposed. If converted at all, it was bound to be converted into stock of a similar nature. According to the Companies Clauses Act, and in conjunction with the Local Act, Mr. Littler contended further, that the unissued capital of the Company, if raised at all, would have to be put up to auction—an operation which would not benefit the Company. Learned Counsel then proceeded to discuss Mr. H. E. Jones's calculations, according to which, purely hypothetically, he made an increased profit for 1894, which capitalized came to £34,000. After stating that the evidence of the Manager of the Company was entirely untrustworthy, Mr. Littler said Mr. Jones had dealt with the gas section as if it was an undertaking capable of doing all its work, and likely to go forward with an annual increase of 5 per cent. But the Company were in as bad a condition as was possible. The chief complaint was as to the pressure of gas; and the Manager tried to establish that the defects were due to bad fittings. This, however, was obviously wrong, because the pressure was intermittent, whereas if the fittings were in fault the absence of pressure would be constant. In order to increase the consumption, Mr. Jones had said he would immediately lower the price of gas; but he had made no allowance in his figures for the alteration. It was an actual fact that since the new works had been started, the consumption of gas for private use had increased by 10 per cent. Was there any other place in the kingdom where, with an increasing population, they had a reduced sale of gas? This pointed to one of two things—that the price of gas in Chesterfield was so ludicrously high that people would not take it, or that the district was so poor that they could not afford to do so. For the purposes of his argument, he did not care which alternative Mr. Cripps took. Passing on, he alluded to the abstention of Mr. Cripps from cross-examining Mr. Stevenson; and he said the only inference that could be drawn was that Mr. Cripps could not rebut Mr. Stevenson's evidence.

Mr. CRIPPS intimated that he did not dispute the data of Mr. Stevenson.

Mr. LITTLER said in that case, as he had not cross-examined Mr. Stevenson, he must also admit his conclusions, and that his evidence could not be controverted. Continuing, he quoted extensively from Mr. Stevenson's evidence, to show the bad position of the Company; pointing out that according to Mr. Stevenson's testimony, the Court were asked to award 28·57 years' purchase of a capital, in respect of the gas section, which had been inflated to three times what it ought to be. As to the stock-in-trade, Mr. Littler quoted the Act of Parliament to show that everything but money and securities for money would pass to the Company under the award of the Court. In conclusion, he stated that the Court were asked to give more than double the face value of the very insecure securities of the Company—some £420,000, with 10 per cent. for compulsory sale, which, besides being monstrous, was an operation of doubtful legality.

Mr. CRIPPS, in reply, said the case from one point of view was simple. The only issue, after what had passed in Parliament, was as to what was a fair and reasonable sum for the Corporation to pay for the undertaking. There was very little difference of opinion as to matters of fact; the conflict arising only as to the application of these facts, and the inferences to be drawn from them. On questions of principle regarding gas, he had called Mr. Hawksley, Mr. H. E. Jones, Mr. Newbigging, and Mr. Valon; while Mr. Littler had thought fit to rest his case upon Mr. Stevenson only. It would, however, be for the tribunal to decide on which side most reliance was to be placed. It was a very valuable factor in the case that both sides were able to accept, so far as the figures were concerned, the tables of Mr. Lass. Mr. Lass said that the total returns for 1894 were £10,072—a figure that was agreed; and taking 22 to 26 years' purchase, the figures of witnesses on the other side, and adding 10 per cent. for compulsory purchase, they would at once have over £300,000. The Corporation of Chesterfield could get £350,000 by paying £10,000 a year, or even less, if the interest were calculated on the 2¾ per cent. tables. He contended that the test to be taken was income, and how that income was secured. If the figures put forward by the Company were adopted in their entirety, the Corporation, on taking over the business, would make a good thing, because they would save Directors' fees and other office expenses. The average profit on gas manufactured in the last three years was £4540; but against this, Mr. Stevenson gave the profit

for the most favourable of the years as £2200. In these circumstances, Mr. Stevenson putting the profit at less than half what it was, he (Mr. Cripps) contended that he was not to be blamed for declining to cross-examine him on his figures. Mr. Bryan and Mr. Woodall, in their report on the Company's business, said there was no prospective value in the water undertaking, and none had been claimed; but the Company did think there was prospective value—and it was asked for—in respect to the gas section, because the effect of having made their large outlay on this branch would be that in future the capital expenditure would be a reducing burden. Continuing, Mr. Cripps alluded to his refusal to cross-examine Mr. Stevenson at the last sitting. He expressed sorrow for having used any harsh term towards him; but he asserted still that, in matters of principle affecting the concern, Mr. Stevenson was quite unreliable. Replying to Mr. Woodall, who had drawn his attention to the paragraph of the above-mentioned report in which it was stated that the capital was invested in works that were too large for the business done, Mr. Cripps averred that if there was an income from an undertaking in a case of this kind, it was immaterial what the capital expenditure to produce it had been, except as it related to the security of the income. In this instance, he contended that the income was well secured, because there had been this large capital expenditure, the benefit of which would be experienced in the near future.

Mr. WOODALL said the interest on the original capital had to be provided; but it was only to be obtained by keeping the price at an admittedly high rate. The balance of profit was in excess of what it should be, because the repairs had been low, and old works had not been written off as discarded.

Mr. CRIPPS replied that so long as the concern was advancing, and they were within their legal powers, they were entitled to charge up to the maximum; the test being whether the charges were so high as to diminish the value of the concern itself. If they were so charging, it should be considered in calculating the value. The learned Counsel went on to say that he had asked that the Company might be allowed to re-adjust the 1894 accounts as regards what had been improvident expenditure under the heading of rates, and as to excessive expenditure for repairs; but while his opponents wanted to subtract enormous sums, as shown in Mr. Stevenson's evidence, they would not allow the excessive rating to be considered. He contended that either the account must be taken as it stood or adjusted all round. Mr. Littler's suggestion as to the declining position of the Company was entirely dissipated by Mr. Lass's figures; and he quoted from them to show that, as indicated by the reduction in the number of empty houses, the increase in the number of houses supplied, and the quantity of gas sold both for public and private lighting, the town was progressing. His case was that, after a considerable period of stagnation, Chesterfield was going ahead. As regarded the water section, he said there were only a few points of difference between the two sides. The first was as to whether 18 or 20 gallons should be the supply per head; and he alluded to the evidence of several of his witnesses to prove that the former figure was sufficient. The Company had not claimed on the total income from water, but only as regarded that arising from the population which they could properly supply. He contended, further, that the cross-examination of Mr. Hill, a hostile witness, fairly regarded, showed that, where there was a trade consumption of only 1½ gallons per day, a supply of 18 gallons was enough. The Court would have to decide the point; and he asserted that the balance of evidence in this connection was in his favour. With reference to the alleged excessive rating, he said it was competent for the Court to adjust an improvident expenditure; and he urged that this should be treated in that way. Mr. Lass had stated that the payment of 15 per cent. of gross earnings in rates was entirely novel to him; and Mr. Bryan said it was unprecedented in his experience. He (Mr. Cripps) affirmed that it should be appealed against; and in answer to Mr. Littler's taunt that they had not done so, he urged that as Mr. Littler had sought to adjust the accounts in various particulars, so he (Mr. Cripps) was entitled to have them adjusted in this respect. Passing to the number of years' purchase, he said Mr. Hill and Mr. Fenwick had both said they would give 30 years' purchase but for what they called the bad future prospects of the concern. As a matter of argument, he must assert that they were wrong; and that for purposes of years' purchase the Company were very well secured. Both Mr. Bryan and Mr. Hill had admitted, as regards the water, that there could not be a more severe test than the season of 1895. Mr. Hill, however, gave a careful calculation to show that even then the Company supplied 46,000 persons on a basis of 20 gallons a day; and when Brimington was cut off from the district of supply, the quantity used by the 4000 people there would be available for Chesterfield.

Sir F. BRAMWELL pointed out that the evidence was that there were 200 houses and about 1000 persons at Brimington.

Mr. CRIPPS assured Sir F. Bramwell that the evidence was erroneous. According to Mr. Lass's tables there were 785 houses occupied, with a population of 4032, at Brimington.

Mr. FITZGERALD said this statement must be taken subject to the qualification that the Company did not supply the whole of the population there.

Mr. CRIPPS accepted the qualification. The population already supplied, he went on to say, numbered 48,500; and deducting the 4000 at Brimington, they had 44,500. Therefore, according to Mr. Hill, they had a considerable margin. Dealing with the assertion that there must be a great expenditure on the water portion of the undertaking, which was given by witnesses for the Corporation as a reason why they reduced the number of years' purchase from 30 to 24, he pointed out that the expenditure was not imminent, because, as the Town Clerk of Chesterfield had stated, the Corporation contemplated lopping off Brimington; and, as shown above, the water thus saved would more than suffice for the remainder of the district. This would obviate the necessity for the great expenditure referred to, and remove the Corporation witnesses' reasons for giving the smaller number of years' purchase. Turning to the gas portion of the business, he asserted that at present too much coke was being used, and that £218 a year could be saved on this account. This was not disputed; and the only question was whether it should be taken into consideration. He claimed that it should. They further asserted that they could get £113 a year more for tar, and that this should be similarly treated. Regarding the item of £444 to be added for insufficient allowances for wear and tear, Mr. Cripps pointed out that Mr. Stevenson put it at £925; but he thought the Court would not accept that against the strong evidence of the Company's witnesses. As to whether the value of the gas section should be allowed at 25 or 28·57 years' purchase, he contended that if ever the higher figure should be given it was in this case, because it was admitted that they were in the best possible condition; having an increasing revenue, with a large capital expenditure in the past which would reduce outlay in the future. Alluding to the prospective value, for which a claim was made, Mr. Cripps said that this depended on the mortgage debt, and on the powers connected with the unissued capital. Under the Act of 1855, they had, he thought, power to convert loans into capital; and he also believed that, under their other Acts, the auction clauses, ordinarily applicable, were not operative with reference to their unissued capital. They were therefore, he submitted, entitled to compensation on both these heads. Mr. Cripps then briefly dwelt on the matter of allowance for compulsory purchase; saying it was perfectly obvious that Mr. Littler had held out to the Parliamentary Committee that the Corporation were to be compulsory purchasers, and that therefore the 10 per cent. should be allowed. In conclusion, he said that although the figure asked might appear high, yet the transfer was certain to be advantageous to the Corporation, because they would be able to raise money at a smaller rate than the Company's profits would be capitalized at by the Court.

The proceedings then terminated; the Court, as is customary, reserving their award.

THE BOARD OF TRADE REPORT ON THE GAS AND WATER BILLS AND ORDERS OF THE PRESENT SESSION.

The Board of Trade report on the applications for Gas, Electric Lighting, and Water Bills and Provisional Orders for the present session has been issued. It shows that the number of Bills relating to the supply of gas is 20, of which 18 are for England and Wales, and one each for Scotland and Ireland. Eleven of the Bills contain provisions in regard to the supply of water. The capital proposed to be raised is £1,705,120—£1,221,430 by shares and £483,690 by loans; and it is all for England and Wales. There are 26 Bills relating to the supply of water—four being for Scotland and one for Ireland. The total capital asked for is £6,837,030—£2,661,000 by shares, and £4,176,030 by loans. Provisional Orders to the number of 14 have been applied for in respect of gas and water supply, and 38 in regard to electric lighting schemes. The capital proposed to be raised under these Orders is: Gas, £152,010; gas and water, £18,750; water, £123,750; electric lighting, £1,275,468. Compared with last year, the number of Gas Bills is increased by four; that of Water Bills, by two. The capital required for gas purposes is £792,120 more, and that for water purposes £4,242,330 more than last year. For Gas and Water Orders the capital proposed is £134,635 more, and for Electric Lighting Orders £723,880 more than in 1895. The applications for the last-named Orders show an increase of nine, as compared with an increase of three last year.

WALSALL GAS-WORKS EXTENSIONS.

A Local Government Board inquiry was held at Walsall last Wednesday into an application by the Corporation for permission to borrow a further sum of £48,000 for gas-works purposes.

The TOWN CLERK (Mr. J. R. Cooper) stated at some length the history of the gas-works, and explained the proposals of the Council. It appeared that up to 1875 the town was supplied by the Improvement Commissioners' works in the borough and the Birmingham and Staffordshire Gas Company, whose works were outside the borough. In 1876 an Act was passed by which the Corporation took over the plant of the Improvement Commissioners with their liabilities of £32,780, and that of the Company for an annuity of £1300, which was capitalized at £37,143. Under the Act of 1876, the Corporation had power to borrow £100,000, which they had exhausted, as well as a further £47,500 subsequently sanctioned. In consequence of the increase in wages and from other causes, the Corporation decided to close their old works in Wolverhampton Street, and only to manufacture at the new works at the Pleck. In 1890 they obtained an additional loan of £32,500; but finding that it would be cheaper to undertake larger extensions than were then contemplated, they had exceeded that amount by £10,000. Still further expenditure was now needed for additional land and for other works; and the Council, therefore, asked for £38,000 for these purposes. This, with the £10,000 already expended in excess of their powers, made up the £48,000 applied for. The present storage capacity for gas was 2,000,000 cubic feet; and the maximum daily demand, 1,926,000 feet. They therefore required an additional holder, and plant equal to producing 500,000,000 cubic feet annually, instead of 379,752,000 feet—the present annual make. The other chief items of expenditure were for the purchase of land, the making of a road and railway sidings, and mains.

Mr. *Brownhill*, the Chairman of the Gas Committee, confirmed the Town Clerk's statement.

Mr. *John Tindall*, the Corporation Gas Engineer, produced plans, specifications, and estimates of the new work, and also of that which had been done in excess of what was contemplated when the last loan was sanctioned.

At the close of the inquiry, the Inspector visited the works.

Incandescent Gas-Lamps for Southend Pier.—The Southend Town Council have accepted the offer of the Southend Gas Company to light the pier with forty incandescent gas-lamps, at a cost of £200, upon which the Corporation will allow 5 per cent. per annum as interest, and pay for the gas consumed at the usual rate.

SOUTH METROPOLITAN GAS COMPANY.

An Extraordinary General Meeting of this Company was held last Wednesday, at the Bridge House Hotel, London Bridge—Mr. GEORGE LIVESEY in the chair—for the purpose of electing a Director in the place of Mr. B. Leigh Smith, who had resigned.

The SECRETARY (Mr. Frank Bush) having read the notice convening the meeting,

The CHAIRMAN said it became his duty to move—"That Mr. John Mews be elected a Director of this Company in the place of Mr. Benjamin Leigh Smith." In doing so, he said that, in response to the notice that there was a vacancy, six or seven gentlemen sent in their names; but the whole of them had withdrawn excepting Mr. Mews. He had therefore great pleasure in moving this resolution. Mr. Mews, in the opinion of the Directors, would make a very suitable colleague. He had a large interest in the Company—a hereditary interest. His father was for many years Deputy-Chairman, and also a Director of the late Phœnix Gas Company. It was not to be supposed that the office of Director was a hereditary one. There had been an interregnum; and the fact that a man was the son of his father certainly could not be taken as a bar to him holding office, if he was in every other way suitable, as the Directors believed Mr. Mews was. He therefore, with their full approval and consent, made this motion. He might say they had a large pile of proxies, which the Directors appreciated highly as a mark of confidence on the part of the shareholders in them.

Mr. W. A. HOUNSOM said he was quite at one with the remark made by the Chairman—that they did not recognize hereditary seats on the Board. He had the greatest pleasure in seconding the motion, because, if they could have a representative of an old stockholder—one holding the name of Mews, to which name some of the shareholders had become so thoroughly accustomed in years gone by—it would give them additional gratification.

The motion was unanimously carried.

Mr. MEWS said he was deeply sensible of the honour the shareholders had done him in electing him to a seat on the Board; and he begged to thank them most sincerely for it. He could assure them that to the best of his ability he would endeavour to promote the interests of the Company, and maintain, or, if possible, increase its present prosperity. He might mention, with respect to the consolidation of the stock, and the fusion of the interests of the various classes of shareholders, that he was entirely of opinion that the policy of the Board was correct.

This concluded the business.

CROYDON COMMERCIAL GAS COMPANY.

The Half-Yearly Meeting of this Company was held last Wednesday, at the Offices, Katherine Street, Croydon—Mr. CHARLES HUSSEY in the chair.

The SECRETARY (Mr. W. J. Russell) having read the notice convening the meeting,

The CHAIRMAN, in moving the adoption of the report and accounts, said that in the six months ending Dec. 31 they had sold gas to the extent of 277,486,100 cubic feet; and, compared with the quantity sold in the corresponding period of 1894, this was an increase of 11,264,200 cubic feet, which was equal to 4·23 per cent. This was not quite so large an increase as they had had on many previous occasions; and he attributed it to the mildness of the weather. However, they compared favourably with other gas companies, who had had about the same proportion of increase. The receipts on capital account during the half year amounted to £822. This was on account of the call that remained unpaid at the time the last accounts were made up on the Carshalton capital shares. The total receipts on capital account now amounted to £319,563. The capital expenditure during the half year had been £15,133. Of this, £1300 had been paid for freehold land adjoining that on which their new gasholder had been erected. On new plant, £12,443 had been spent. The principal portion of this represented the balances paid to the Contractors for the new gasholder and tank, and the cost—£1275—of two new exhausters and an engine. New mains had cost £817; new meters, £270; and new stoves, £300. The expenditure in these various directions had become absolutely necessary to keep pace with the times. Some people thought they had been spending money rather freely; but the capital was only equal to £5 16s. per ton of coal carbonized, which compared very favourably with other companies, many of which were higher. They would not have been quite so high as this had not the amalgamation with the Carshalton Company taken place, as the capital of that Company per ton of coal stood at much more than their own. The total receipts on revenue account were £51,964. They had received by the sale of gas £38,290; being £498 more than in the corresponding period of 1894. To show that the Company were not going back, he said the increase in consumption in the five years to Dec. 31, 1890, had amounted to no less than 28·84 per cent.; and in the past ten years, it had been 66·99 per cent. The meter-rental amounted to £887. It might have been noticed by the shareholders that they had not quite such a large balance to carry forward on this occasion; but, of course, they could not expect to make reductions in the price of gas and in the meter-rental without feeling it somewhat. When these were made, the Company were in high flight, because they had had two exceptionally severe periods in the second half of 1894 and the first of 1895. The reduction of 1d. in the price of gas was a loss to the Company of £1156; and the reduction of 3d. in the meter-rents represented £212. The rental of gas stoves and fittings amounted to £892, or an increase of £123. The residuals market had been a great source of anxiety to the Directors; but they had not been more bothered in this respect than other companies. Coke had been in a shocking state; the sales having produced £8027, or £2758 less than in the corresponding period of 1894. This was an average of 1¼d. per cwt. less, or equal to 3d. per 1000 cubic feet of gas sold. Breeze was also £97 less. On tar they had an increased sale of £120. Sulphate of ammonia was another very bad residual. The sales, although larger, had averaged £3 7s. 9d. less per ton, and had caused a loss of £646. Coming to the expenditure on the revenue account, the total was £40,262. The outlay on coal had been £19,186. Although they had carbonized 731 tons more than in the second half of 1894, the coal had cost £1497 less. The shareholders would doubtless think this very singular; but it was easily explained. In 1893, after the coal strike had taken place, they make a contract with Messrs. Stephenson Clarke and Co. for a term of three years, at a price which the Board thought could not be lower. However, it did go much lower; and Messrs. Stephenson Clarke and Co. generously came to their rescue in April last, and, instead of pinning the Company to their contract (which would not have expired until midsummer of this year), offered to cancel it, and to supply coal at 1s. 8d. per ton less. This was exceedingly liberal on their part; and he wished to acknowledge it. He (the Chairman) had reckoned out roughly what this reduction would represent from the spring of 1895 to midsummer this year; and he found that it meant a saving of upwards of £5000. Not only did the Contractors reduce the price of common coal, but they lowered the price of cannel by 8s. per ton; and this he had included in his estimate. In pointing out the differences in the other items of expenditure, the Chairman referred to an increase of £115 in the public lighting. He said this was mainly accounted for by an installation of incandescent lights that they had made in three or four of the principal streets, to show what could be done by this system. Everyone acknowledged that they were highly pleased with the lights; but the Directors had not received any communication from the Corporation as to extending them or as to their continuance. They heard, however, that, after some three or four years' discussion, the electric light was to be introduced. The lighting was to be undertaken by a Company, to whom the Corporation were to lend the money to carry out the work. It was acknowledged that to put the electric light into a small central area of the borough would cost £400 a year more than the supply of gas to that area. The balance carried from the revenue account to profit and loss was £11,701; and, with the undivided profits brought forward, the sum available for dividend was £14,543. The dividend would amount to £13,833, and leave a balance of £709. During the half year they had fixed 80 additional ordinary meters, making a total of 8418; and 242 cottages had been fitted up on the prepayment system, making a total of 1247. Cooking and heating stoves to the number of 279 had been fixed; bringing the total up to 3116. They had had several applications for prepayment meters from the Carshalton district; and they had now decided not to extend the system they had in use in Croydon, but to adopt the penny-in-the-slot meter, as this would be more economical to the Company. Regarding rates and taxes, as the shareholders were aware, the Company had had a dispute with the Assessment Committee as to the amount at which they wished to assess their property for the poor-rate. The Directors thought the sum the rating was increased to was much ahead of what it should be; and so they endeavoured as far as possible to meet the Committee fairly. But they would not listen to reason, so the Directors thought. The last assessment of the property was made in 1885, when they were placed at £10,000; and, of course, the Directors fully acknowledged that an increased assessment was now perfectly justified. Fortunately, they had on their Board a gentleman—Mr. Corbet Woodall—who was thoroughly conversant with this subject; and he took up the matter with a small Committee of the Directors. The valuer appointed by the Assessment Committee (Mr. Jones) raised the assessment from £10,000 to £19,904. Mr. Woodall had interviews with the Committee and with Mr. Jones; and the result was that the Committee reduced the assessment to £18,343, which was a reduction at once of about £1600. Even this did not satisfy the Directors. Mr. Woodall was prepared to justify a much greater reduction, and they offered to meet the Committee most liberally. The result of their appeal to Quarter Sessions was that the Recorder reduced the assessment to £15,305, which showed that the Directors were perfectly right in resisting the Committee's figures. Although they had costs as against the other side, the charges they would have to bear in connection with the matter were unfortunately estimated at £800; but the Directors hoped this amount would be somewhat reduced. After a reference to the new gasholder [see "JOURNAL" for Nov. 12 last], the Chairman mentioned that they were about to sell by auction £5900 of consolidated "B" stock, and to make a further call of £2 per share on the Carshalton capital shares. Concluding his remarks, he said that he thought they had as good a credit as any gas company in the kingdom; for, he believed, very few companies, with their amount of capital, could boast of a reserve fund of £30,965, and an insurance fund of £14,130.

Mr. A. J. LAMBERT seconded the motion, which was carried.

Mr. CORBET WOODALL moved the declaration of dividends at the rates of 14, 11, and 9 per cent. per annum on the various stocks and shares. He said he proposed the resolution without any fear or reservation, although they had not, during the past half year, earned the dividend; but that was not an uncommon state of things. The amount of a gas company's profit in the two halves of a year varied considerably; and this had not been the most profitable of the two. But even had this reason had no particular weight, he would still have proposed the resolution upon the accounts as they stood. As the Chairman had told them, while a reduction had been made in the price of gas amounting to about £1150, and also a reduction in the meter-rental, yet they had had an absolute increase in the revenue of more than £600 in the half year; and this was a thoroughly satisfactory state of things. The loss they had sustained upon the products was one that might continue; but they hoped it would not. The decrease in the sum paid for coal—amounting, in round figures, to £1600—was entirely absorbed, and several hundred pounds more, by the diminution in the revenue from coke alone. However, with a business growing at the rate of theirs, they need not have any scruple whatever in drawing, if necessary, upon the very substantial and handsome sum standing in the reserve fund. Regarding their rating, he said the Directors had throughout recognized the fact that they ought to pay an increase upon the old rating; but he did feel that it was their bounden duty, in the interests of the consumers and shareholders alike, to see that the amount paid by the Company was not excessive. It was not fair that the consumers should have to pay their own rates and an excessive amount of other people's through the price charged for gas.

Mr. MARTIN TAYLOR seconded the motion, which was carried.

The retiring Directors (Mr. T. Rigby and Mr. Woodall) and Auditor (Mr. J. C. Benwell) were re-elected.

The services of the Chairman and Directors having been heartily recognized,

The CHAIRMAN moved a vote of thanks to the officers and staff, and spoke of the excellent manner in which both the Secretary (Mr. W. J. Russell) and the Engineer (Mr. J. W. Helps) looked after the interests of the Company. Referring to Mr. Helps, he said that the strain of the hard and anxious time he had had during the past three or four years in carrying out the extensions at the works unfortunately caused him to break down; and the Directors thought it best to send him away for a two months' holiday. He had been to Egypt; and he (the Chairman) was pleased to say he had returned very much better.

Mr. S. SPENCER seconded the motion, which was cordially agreed to.

In responding, Mr. RUSSELL stated that he had been connected with the Company since 1863, and was now in his twenty-fifth year as Secretary; and Mr. HELPS expressed his sincere appreciation of the generous treatment he had received from the Directors.

THE LONDON COUNTY COUNCIL AND THE SOUTH METROPOLITAN GAS BILL.

At the Meeting of the London County Council last Tuesday, a report was presented by the Parliamentary Committee on the subject of the South Metropolitan Gas Bill. They pointed out that the first object of the Bill is to consolidate the capital of the Company, and convert it from a 10 per cent. to a 4 per cent. capital; thus increasing the nominal capital of the Company to two-and-a-half times its present amount. The Committee went on to say that the Bill also proposed to take power to offer new capital in the first instance to gas consumers and employees of the Company at the market price, instead of issuing it under the auction clauses. The Company introduced a similar Bill last year, by which it was proposed to convert their capital from a 10 per cent. to a 5 per cent. capital. The Council opposed that Bill. After hearing arguments and evidence, the Select Committee of the House of Commons rejected the clauses relating to the conversion of stock; and the Company thereupon withdrew the remainder of the Bill. The Select Committee made a special report on the matter to the House, to the effect that they considered "the subject of conversion of stocks was one of so far-reaching importance, that it ought to be dealt with by a Committee specially appointed to consider the same, as affecting gas and water companies." The Committee further reported that the Chairman of the Company (Mr. George Livesey) had attended their meeting for the purpose of affording information on the proposals of the present Bill; but, after discussing the matter with him, the Committee thought, in view of the important decision of the Select Committee, that the Council should pursue a similar course to that taken with regard to the Bill of last year. They accordingly recommended that a petition be sealed and presented against the present Bill. Mr. Beachcroft opposed the recommendation. He stated that the Bill had been drawn up in the interests of the consumers and employees, the latter of whom he said would become shareholders and be represented by a director. The only matter in which the Council were interested was a proposal to acquire some land near the Blackwall Tunnel; and it was on this point that the measure should be opposed, if at all. It had been reported by the Comptroller that the selling value of the Company's stock would be improved by about £450,000; but Mr. Livesey had put it at £91,000. However, this had nothing to do with the Council. He proposed that the following words should be added to the recommendation: "In reference to the proposed taking by the Company of land belonging to the Council." Mr. Reed seconded the amendment. Mr. Burns pointed out that, so far as the Bill being drawn up in the interest of the workmen was concerned, they would be directors only nominally, and would receive the wages of stokers while helping to manage the affairs of the Company. This proposal was only another form of the ingenious political pandering and economical corruption to which the working classes were being subjected. Mr. Thornton said he believed the only object of favouring the workmen was to induce them to put their savings in the concern, so that the men could be better manipulated, and a repetition of former difficulties avoided. Mr. M'Kinnon Wood said that Mr. Livesey had stated before the Committee that no new capital would be issued; therefore no benefits would accrue to the workmen for the next ten years. Mr. Beachcroft's amendment was then put to the Council; but it received only 16 supporters. Mr. Harris then proposed the addition of the following words to the recommendation: "And that the Committee be instructed to consider and report as to the expediency of taking steps to have the whole question of conversion of stocks as affecting gas and water companies referred to a Special Committee, as suggested by the Select Committee which considered the Bill last year." Mr. C. H. Campbell seconded the proposition. On a show of hands, the amendment only received 11 supporters; and the Committee's recommendation was carried.

The Leeds Corporation and the Demands of their Workmen.—With reference to the resolutions adopted by the Leeds Corporation Gas Committee bearing upon the demands of their workmen for certain increases in wages and reductions in the hours of labour, it appears that there was some misunderstanding regarding the wording of the one alluding to the cinder-throwers (see *ante*, p. 403). At the meeting of the Committee last Thursday, they agreed to an amended resolution, giving the cinder-throwers an eight-hour day; the conditional clause being deleted. The proposals of the Committee will have to come before the Council for confirmation; but, in the meantime, the representatives of the workmen have passed a resolution, regretting that the Gas Committee should "have broken their promise made to the men's deputation on Feb. 4 to inform them of their decision *re* the men's application for an advance of wages and alteration of working conditions," and declining, under the circumstances, "to come to any definite decision on unofficial Press statements."

PROVINCIAL GAS AND WATER COMPANIES.

Gas Companies.

At the half-yearly general meeting of the Brighton and Hove General Gas Company on the 13th inst., the Directors will report a further increase in the sale of gas in the six months ending Dec. 31, 1895; but, as in the case of other companies, there has been a falling off in the amount received for residuals. The price of gas in the Company's district was reduced 2d. per 1000 cubic feet on Jan. 1 last. Water-gas plant has been completed at Portslade; and it is in successful operation. Automatic prepayment meters have been introduced, and have so far been giving good results. The Directors will recommend dividends at the rates of 11, 8, and 6 per cent. per annum upon the three classes of stock. The accounts to be presented show receipts to the amount of £80,431; the expenditure being £64,653 (including £31,557 for coal and enriching materials)—leaving a balance of £24,778. The balance of net profit available for distribution is £33,373. The works (under the supervision of Mr. J. Cash, M.Inst.C.E.) carbonized 44,428 tons of coal and 344 tons of cannel; the estimated production of residuals being: Coke, 58,743 chaldrons; breeze, 2371 tons; tar, 459,913 gallons; and ammoniacal liquor, 1,068,398 gallons. The total quantity of gas sold was 472,639,600 cubic feet, of which 33,396,000 cubic feet were for public lighting and under contracts.

The annual meeting of the Canterbury Gas and Water Company was held on Monday last week—Mr. D. Amos presiding. In moving the adoption of the report, the Chairman said it was a source of congratulation to find the Company had continued success. Their business had been increasing with regard to both gas and water. They had put in new gas plant, and it only remained to connect the present mains with it. This could be done more satisfactorily when the days lengthened, and the demand for gas was less. The old buildings, consisting of the station-meter house and the engine-house and forge, would then be pulled down, and they would have the works and plant in thoroughly good order, and be able to carry on their business for many years. The severe frost last year gave some trouble; but they had overcome it successfully. The extra demand for gas was counterbalanced by the expense of clearing the obstructed service-pipes. With regard to the contracts with the Corporation for the supply of gas and water, they had been renewed on what he hoped would be regarded as reasonable terms. The report was adopted, and a dividend of 4½ per cent. was declared for the six months ending Dec. 31; making with the interim dividend 9 per cent. for the year. The Chairman then proposed that the number of Directors be reduced to nine. Mr. Greasley submitted an amendment that the number be raised to twelve until otherwise ordered. This, however, was lost, and the Chairman's proposition was carried. The three retiring Directors were re-elected, and Mr. J. Flint and Mr. J. Hunt were chosen as members of the Board. A vote of thanks to the officers of the Company having been proposed, Alderman Hart, in seconding the vote, said the greatest thanks were due to the officials. In Mr. Burch they had one of the ablest secretaries a gas company could have; in Mr. May, an excellent Manager; and in Mr. Buckley, the Manager of the water-works, one of the best of men. He thought they were under a debt of gratitude to these gentlemen, for in a great measure they had placed the undertaking in the position in which it stood that day. The proposition was agreed to, and the proceedings closed.

The Chelmsford Gas Company's profit and loss account shows a balance of £1823 on last year's working; and a dividend of 6 per cent. per annum on the original shares, and £4 4s. on the additional shares, has been declared. A loss of £263, as compared with the previous year, is recorded as the result of the fall in the market price of coke and sulphate of ammonia; and the receipts from the sale of gas show a decrease of £148. The rates and taxes have increased £35; and £200 has been expended in renewing a portion of the plant for the manufacture of sulphate of ammonia.

The Colchester Gas Company's half-yearly balance-sheet shows an expenditure of £8480; and receipts amounting to £19,714—leaving a balance of £11,234. A dividend at the rate of 10 per cent. per annum on the old, and 7 per cent. on the new shares, has been declared for the half year ending December.

The accounts presented at the half-yearly meeting of the Douglas Gas Company showed a profit of £3998, which, with the balance brought forward, made £5199 available for distribution. The Directors recommended a dividend at the rate of 35s. per share. The Chairman (Mr. Joseph Kay) moved the adoption of the report, and said that, though they had done an increased business during the half year, this had been neutralized by the low price of the residual products. The motion was carried.

In the report submitted at the recent annual meeting of the East Grinstead Gas and Water Company, the Directors informed the shareholders that the receipts from the sale of gas during 1895 were £2925, against £2789 in 1894; from residuals £705, against £735; and from water £1321, against £1286. Dividends of £6 and £4 4s. per cent. on the various classes of shares were recommended. The Chairman, in moving the adoption of the report and accounts, referred to the overtures of the District Council for the purchase of the Company's property. Speaking for himself, he said that, if the Council were prepared to pay a proper price, he was willing to sell. The motion was carried.

The accounts submitted at the meeting of the Eastbourne Gas Company yesterday week showed a profit upon the working of the past half year of £6019, which, added to the balance brought forward (£10,353) and £141 received for interest, gave a total of £16,513 available for division. The Directors recommended dividends of 14 and 11 per cent., after paying which there will be a balance of £10,664 to be carried forward. The adoption of the report was moved by the Chairman (Dr. Jeffery), who stated that, notwithstanding the mild weather and the drop in the value of the residuals, the Company had made a profit sufficient to enable them to pay the maximum dividends. The sale of gas in the half year was 110,771,000 cubic feet, as against 108,196,000 feet in the corresponding half of 1894; being an increase of 2,575,000 feet, or 2·38 per cent. The quantity of coal

carbonized had been 11,204 tons, as against 11,211 tons; and the make of gas had been 117,296,000 cubic feet, or an average of 10,000 feet per ton. The loss by leakage had been only 4·23 per cent. Alderman Farncombe seconded the motion, which was carried. A petition was subsequently read, signed by nearly 250 persons, urging the Company to adopt the penny-in-the-slot system; but the Chairman said he was of opinion that, with only such a small number, the return would not justify the effort and the risk. The Consulting Engineer (Mr. H. E. Jones), however, expressed himself as strongly in favour of the system, and thought the working classes had a claim upon the Company for some concession in this respect. It was agreed to leave the matter in the hands of the Directors.

The Directors of the Hastings and St. Leonards Gas Company will report, at the meeting of shareholders to be held on Thursday, that the growth of the Company's business has been maintained. The price of gas in the six months ending Dec. 31 last was 3s. 2d. per 1000 cubic feet – a reduction of 2d. as compared with the corresponding period of 1894; and as from the commencement of the present year the figure has been further brought down to 3s. As with most gas companies, the mild weather and the depression in the market for residuals considerably affected the returns from this source. The use of incandescent gas-burners is rapidly increasing; and the demand for automatic prepayment meters and gas-stoves continues. The accounts show that a sum of £28,059 was received for gas; meter and stove rentals came to £1391; residuals produced £6501; and the total revenue was £36,120. The expenditure for coal was £13,450, in addition to which £2035 was paid as duty to the Sanitary Authority—making together £15,485; and the other expenses connected with the manufacture of gas brought this amount up to £20,871. Distribution cost £1501; management, £1112; and rates, taxes, and insurance, £889. The total expenditure was £25,062; leaving £11,058 to be carried to the profit and loss account. The Directors recommend the payment of dividends at the rate of 12½ per cent. per annum on the £25 shares, and of 9½ per cent. per annum on the £20 shares. Under the supervision of Mr. C. E. Botley, Assoc. M.Inst.C.E., the Company's Engineer and Manager, 16,800 tons of coal and 299 tons of cannel were carbonized; the quantity of gas made being 176,681,000 cubic feet. Of residuals the following estimated quantities were produced: Coke, 10,491 tons 17 cwt.; breeze, 814 tons 6 cwt.; tar, 164,456 gallons; ammoniacal liquor, 338,207 gallons

The annual general meeting of the Hertford Gas Company was held on the 20th ult.—Mr. A. S. Gilbertson in the chair. The report showed an available balance of £916, of which it was proposed to apply £413 in reducing the suspense account; leaving £503 for division. The Directors recommended a dividend for the past half year at the rate of 5 per cent. per annum, free of income-tax. Reference was made to the proceedings taken against the Company in October last in reference to the preparation and sale of their accounts, when a nominal fine of 1s. was imposed for each of the offences with which the Company were charged. The Chairman, in moving the adoption of the report, pointed out that whereas for the half year ended June, 1895, the coal cost 19s. 10d. per ton, for the six months just ended it had only cost 16s. 8d. per ton. This was partly accounted for by a reduction in the price of coal, and partly by the fact that much less cannel had been used than previously. Then, again, their production of gas per ton of coal carbonized was satisfactory; being 10,200 cubic feet—a figure which compared very favourably with the make of other companies. The quantity of coke used for fuel last year was 59·35 per cent.; whereas for the half year just ended, it was only 34 per cent. The coke sold in the six months ending June, 1895, averaged 14s. per ton; whereas for the past half year, it had only amounted to 13s. 5d. per ton, yet they had received an increased income from this source. This was due to the fact that, as they had used less, they had had a greater quantity available for sale. The loss sustained in the previous year upon ammoniacal liquor—£6 11s. 6d.—had been turned into a profit of £7 12s. 7d. They had also made a profit upon their fitting account. In conclusion, he pointed out that in the half year ended June, 1895, the net proceeds of residuals amounted to only 29·93 per cent.; but for the past similar period, it had been 44·2 per cent. Mr. E. Manser seconded the motion. Mr. E. S. Hanbury called attention to the fact that the financial statement was signed by Messrs. Alfred Lass, Wood, and Co.; and he asked whether they were responsible for the balance-sheet, or the Auditors appointed by the shareholders. The Chairman replied that Messrs. Lass and Co. were responsible. Mr. A. Hanbury then asked whether it was necessary to have two other Auditors as well. The Chairman said that, in accordance with the Act of Parliament, it was necessary to appoint two other Auditors. Messrs. Lass and Co. not only prepared the balance-sheet, but gave a great deal of valuable advice. As experts, they could also show where any little weakness lay. Mr. H. L. Warner pointed out that Messrs. Lass and Co., as accountants, were only responsible to the Directors; whereas the Auditors were responsible to the shareholders. The report having been adopted, Mr. Manser was re-elected a Director of the Company; and Mr. J. R. Cocks was chosen to fill the vacancy on the Board caused by the death of Mr. R. Cocks. Mr. C. E. Longmore proposed the re-election of Mr. G. A. Munnings as one of the Auditors. Remarking upon the question raised by Mr. Hanbury as to whether it was necessary to continue to appoint Auditors besides the Accountants, he pointed out that this must be done according to the Act of Parliament. He thought the shareholders would agree with him that the Directors had acted very wisely in employing a firm of experts like Messrs. Lass and Co., for the information given by them was of a most beneficial character. It had been suggested that they might do away with the Auditors; and with all respect to those gentlemen, he must say he would rather see them done away with than Messrs. Lass and Co., because he had the greatest confidence in the investigation of accounts by experts. Having offered a few remarks on the general position of the undertaking, he concluded by expressing the opinion that, having regard to the very disastrous condition into which the Company fell through circumstances with which the shareholders were all well acquainted, but which happily were now over, the Directors were to be congratulated upon the result of their labours during the past few months. The proposition was carried unanimously; and Mr. W. H. Cook was appointed as one of the Auditors in place of Mr. J. R. Cocks, resigned. The dividend recommended was then declared.

The 26th annual general meeting of the Longwood Gas Company was held on the 20th ult.—Mr. E. Armitage presiding. The Manager and Secretary (Mr. J. L. Mitton) read the notice convening the meeting; and the statements of accounts were taken as read. The Chairman, in moving the adoption of the report, congratulated the shareholders upon the successful year they had just completed. Referring to the expenditure upon capital and revenue, both had, he said, justified the Company in making the alterations they had done. Had it not been for the serious reductions in the prices of residuals, which were unavoidable, the profits would have been considerably higher. However, he was pleased to point out that, though the dividends were the same as last year, the balance carried forward was some £300 more, which placed them in a much better position. The leakage account for the half year ending Dec. 31 stood at 9⅝ per cent. This he considered spoke volumes for Mr. Mitton's management of the works. He was glad to announce that the Directors had decided to reduce the price of gas 3d. per 1000 cubic feet from the 1st of July next. The Vice-Chairman (Mr. R. Thornton) seconded the motion. In doing so, he spoke in praiseworthy terms of the Manager and Secretary; referring specially to the courtesy he showed both to the Directors and the consumers, which had won for him much respect and esteem. Before concluding, he confirmed the remarks of the Chairman as to the leakage. He said he remembered that only some six years ago it was 22 per cent.; whereas now it stood a little under 10 per cent. This was the best testimony that could be shown as to the management of their works. Mr. B. Broadbent drew attention to the fact that the profit some five years ago, with nearly 6 million cubic feet larger sales of gas, was only about £30 more than what they made in the year just completed. This, to his mind, would afford a clear proof to the shareholders that their works were never better managed than they were at present. The motion was carried unanimously. A vote of thanks was then cordially passed to the Chairman and Directors.

The report of the Matlock and District Gas Company, Limited, for the past year discloses a very satisfactory position. On the revenue account, there is a balance of £1993; and at the credit of the net revenue account, after the payment of the debenture interest and the interim dividend, there is a sum of £1138 available for division. The Directors recommend the payment of the statutory dividends for the latter half of the year. New shares have been issued to the amount of £1500; and they realized, by tender, a high price—the premiums amounting to £658 17s. 6d., giving an average price of £143 18s. per cent. The Directors also report that a new gasholder has been completed, and has been in use during the whole of the winter. Its maximum storage capacity is 155,000 cubic feet. Previous to this addition being made, the total storage capacity was only equal to twelve hours' maximum consumption; but it is now equal to 40 hours'.

At the second ordinary general meeting, since its incorporation, of the Newmarket Gas Company, which was held on the 17th ult., the Directors presented the accounts for the five months ending Dec. 31, 1895, in virtue of a resolution come to at an extraordinary meeting at the end of the year, authorizing the holding of the annual meeting in future during February. The net balance of profit earned during the above-named period was £2033, which, with £1429 brought forward, made £3462 standing to the credit of the profit and loss account. The Directors recommended that this amount should be appropriated as follows: A dividend at the rate of 6½ per cent. upon the original consolidated stock (less income-tax), £1510; to the reserve fund, £500; to be carried forward, £1452. The Chairman (Mr. R. Stephenson), in moving the adoption of the report, pointed out that the balance-sheet presented showed more than the usual profit; but that this must not be taken as an indication of increased earnings, as working for five months was not the same as for a complete year. The motion was carried unanimously. Messrs. Stephenson and Bosworth were re-elected Directors, and Mr. H. H. Eeles an Auditor, of the Company. In answer to a question, the Manager and Secretary (Mr. J. H. Troughton) stated that 101 "slot" meters had been sold as the result of sending out circulars; and the Company had four incandescent gas-lamps in the High Street. The proceedings closed with the usual compliments to the Chairman, the Manager and Secretary, and the officers.

The Chairman of the Ossett Gas Company (Mr. W. Statter) congratulated the shareholders at their recent half-yearly meeting upon the satisfactory report the Directors were able to present. The gas made during the half year showed an increase of 3,193,000 cubic feet compared with the corresponding period of the previous year, which was equal to 8½ per cent. The sale of gas had realized £260 more, notwithstanding the reduction of 3d. per 1000 cubic feet made in the price last July. Full dividends of 10 and 7 per cent. respectively were declared on the "A" and "B" shares, and £135 was added to the reserve fund. A question was asked as to the action of the Ossett Corporation in regard to the purchase of the works. The Chairman, in reply, stated that, towards the latter end of last year, the Corporation wrote asking if the Company were willing to sell. The Directors replied that they had no desire to do so; and they had received no official communication since. He understood, however, that it was the intention of the Corporation to promote a Bill in Parliament for the acquirement of power to purchase compulsorily. A cordial vote of thanks was passed to the Chairman (who has held the post since the formation of the Company) and his colleagues for their services.

The receipts of the Penryn Gas Company (of which Mr. R. Fish is Chairman) for the past year amounted to £937; the expenditure, to £653—leaving a balance of £284. The sum available for division at the recent annual meeting was £161; and the Directors recommended a dividend which, with the interim dividend paid in August last, made 4½ per cent. for the year.

The annual meeting of the Redhill Gas Company has been held under the chairmanship of Mr. J. Lees. According to the report presented, the consumption of gas had increased partly through the dull and severe weather, and partly by prepayment meters. These had proved a success, and had added some 270 to 280 new consumers; but the profits had been diminished by the low price of residuals. The experiment of lighting the roadways with incandescent burners was being carried out; and the Directors contemplated making a more extended test. The financial statement showed a balance of £4765, out of which £200 had been appropriated for the reserve fund, leaving £4565 avail-

able for dividend. An interim dividend of 4½ per cent. was paid in September last; and the Directors recommended that a further 5½ per cent. be now paid. In the course of his remarks, the Chairman said that, but for the fall in the price of residuals, the Directors would have been able to show a larger profit than they had announced; but he was induced to hope that, if the shareholders went carefully through the balance-sheet, they would be satisfied with the year's working. The quantity of gas made in 1894 was 62 million cubic feet; in 1895, it was 69 millions, which was a gratifying increase of 7 million feet, or 10 per cent. Then, again, the loss of gas amounted to 2¾ per cent. in 1894; while in 1895 it had been reduced to 2 per cent. This was partly accounted for by the increase of storage, and the great care exercised in the maintenance of the plant. Against this he had to set the drop in the value of residuals. The amount received for coke in 1894 was £2479; in 1895, it was £2347. There was a little increase in tar; but there was a lamentable falling off in sulphate of ammonia. With regard to prepayment meters, they first fixed 25 as an experiment; and now they had 280 in use. The report was adopted.

The Salisbury Gas Company had their half-yearly general meeting on the 19th ult.—Mr. G. Fullford in the chair. The Secretary (Mr. A. Whitehead) read the notice of meeting; and also the minutes of the preceding meeting, which were approved. In moving the adoption of the report and accounts, he said there had been a slight reduction in the manufacturing expenses in the half year ending Dec. 31, due to cheaper coal and improvements in working; but the cost of repairs and renewals had been £140 more. The most satisfactory feature, to his mind, was the fact that, notwithstanding the mild weather and the reduction of price, which really meant a decrease of £143 in the income, the sales of gas were £103 more than for the corresponding half of 1894. The incandescent gas-burners lately introduced certainly used less gas, but it was evident that they led to additional business; and the use of gas for purposes other than lighting was steadily increasing. Altogether, he considered the affairs of the Company were in a healthy state. The works were maintained in good order, and in an efficient condition for the discharge of their obligations. Mr. S. Griffin seconded the motion; and it was carried. The usual dividends on the various classes of shares—ranging from 5 to 10 per cent. per annum—were declared. Mr. H. B. Wells moved a vote of thanks to the Chairman, Directors, and staff of the Company generally. Mr. Noyle seconded the motion; and it was heartily carried. Mr. Atkins having acknowledged the vote on behalf of the Directors, by whom, he said, it was much appreciated, the Chairman referred in complimentary terms to the principal officers of the Company, and called upon the Manager (Mr. N. H. Humphrys, Assoc.M.Inst C.E., F.C.S.) to reply on behalf of the staff. Mr. Humphrys said that without the kindness and consideration he had always received from the Chairman and Directors, and the able way in which he was supported by the staff, it would not have been possible to obtain the figures which had met with such a gratifying reception.

The accounts to be presented at the annual general meeting of the Shotley Bridge and Consett District Gas Company to-morrow, show an increase to the extent of 5 per cent. in the sale of gas in the second half of 1895, as compared with the six months ending Dec. 31, 1894. The receipts amounted to £4572; the expenditure, to £2920. After paying the interest upon loans (£71 17s. 6d.), the Directors propose to appropriate £1275 in paying dividends of 5 and 3½ per cent. for the half year, place £200 to a gasholder renewal fund, and carry £105 forward. The quantity of coal carbonized in the six months was 3463 tons. There were 22,150,000 cubic feet of gas sold; the following estimated quantities of residuals being produced: Coke, 2070 tons; tar, 34,000 gallons; and sulphate of ammonia, 20½ tons.

The report of the Directors of the South Shields Gas Company for the year ending Dec. 31 stated that the revenue shows a profit of £19,967; and, after deducting the interim dividend and interest paid during the year, there remained an available balance of £11,130, inclusive of £654 brought forward. The Directors proposed a dividend of 4¾ per cent. for the half year, which, with the interim payment of 4½ per cent., makes 9¼ per cent. for the year. It was, at the same time, proposed to pay off the ¾ per cent. balance of arrears of dividend which has stood over since 1891. It has been decided to credit the insurance fund with £1384, and the reserve fund with £822, which will bring the former up to £3000, and the latter to £4500. The report came before the shareholders at the annual general meeting of the Company last Friday. Mr. R. Wallis, in moving its adoption, remarked that he did so with much pride and gratification, as it was the 61st time he had had the honour of presiding over the proceedings. He had seen many changes, many vicissitudes; but he was proud to think that the Directors had to lay before the proprietors a report and balance-sheet which were fairly satisfactory. Whether they looked to the Stock Exchange, to the public sales of gas stock, to the ever-varying use of gas and its residuals, the enormous increase of consumption, or to the gradual reduction in prices, everything pointed to gas stock as being a safe and profitable investment. The price had not reached finality. Consumption was enormously on the increase; new uses for gas and its residuals were constantly arising; and there had been throughout the kingdom during the year a rise, on an average, of 20 per cent. premium on gas stock. The Company might fairly claim to be in the van of progress. At a recent sale of £10,000 worth of their stock—then standing in the lists at £195—the average price was £208 9s. 9d. At the present time, this stock stood at £221; and it was cheap at the price. The report was adopted, and the dividend proposed, with the arrears, was declared.

The 50th ordinary general meeting of the Thirsk Gas Company was held at Hull last Wednesday—Mr. R. B. Gray, the Chairman of the Company, presiding. The Directors' report, which was unanimously adopted, recommended the payment of a dividend on the original and additional capital of 4 per cent. for the half year ending Dec. 31 last; making, with the interim dividend of 3 per cent., 7 per cent. for the year. The report states that during the past year the entire bench of retorts had been completely renewed, and several substantial improvements effected at the works; and that, owing to the satisfactory progress of the Company's business, the Directors had decided to reduce the price of gas from 4s. to 3s. 9d. per 1000 cubic feet, the reduction to take effect from the 1st of July next.

Presiding at the annual meeting of the Uxbridge and Hillingdon Gas Consumers' Company, the Chairman (Mr. W. Fassnidge) stated that, compared with 1894, the receipts for gas sold, for meter-rental, and residual products, &c., were less by £291. The quantity of gas sold in 1894 was 32,142,900 cubic feet; and in 1895, 32,482,600 feet. The Directors had hoped that the reduction of 3d. per 1000 cubic feet of gas from March last, would have given better results. The amount realized for coke, breeze, tar, and liquor was for 1894, £1436, and for 1895, £1351. The gross expenditure for the year, however, had been less than in 1894 by £107, notwithstanding the increase in the amounts chargeable to rates and taxes. After paying the debenture interest, &c., there would remain a sum of £2739, which, with the surplus profit of the previous year, gave for disposal £3138. This was sufficient to pay the statutory dividends (amounting to £2575), and leave a balance of £563 to be carried forward. The Directors had undertaken to supply prepayment meters; and they appeared to be much appreciated by the consumers. Before concluding, he mentioned that their Engineer and Manager (Mr. S. Penny) had addressed a letter to the Directors, signifying his willingness to give up a portion (£50) of his salary, hoping that, when the consumption of gas increased, they would see their way clear to raise his salary by that amount. The report was adopted, and the statutory dividends declared.

The 54th half-yearly general meeting of the Waltham Abbey and Cheshunt Gas Company was held last Friday—Mr. Corbet Woodall presiding. The accounts for the past half year show a balance of £1918, out of which the Directors recommended dividends at the rate of 7 per cent. per annum on the "A" shares, and 5 per cent. per annum on the "B" and "C" shares; leaving £709 to be carried forward. The Directors' report stated that the sale of gas had increased by a satisfactory percentage, derived in part from the extension of mains to meet the demand for additional public lighting, and in part from the progress of the automatic meter system. The poor prices for coke and other residuals prevailing during the half year had, however, influenced the revenue unfavourably. The Chairman, in moving the adoption of the report, spoke of the decrease in the price obtained for residuals. But he mentioned that very good business had been done by means of the automatic prepayment meters. The report was adopted without comment. Mr. Parnell moved the declaration of the dividend recommended. Mr. Parnell was re-elected a Director. Mr. Schofield, who has held the post of Auditor since 1877, retired; but he did not seek re-election. Mr. James Randall and Mr. W. Beck were candidates for the vacant auditorship; and the former was chosen by a large majority. An extraordinary meeting followed, at which it was agreed to issue share capital to the amount of £7500, and to raise on mortgage £3125 under the Company's Provisional Order of 1881. Votes of thanks to the Chairman, Directors, and officials closed the meeting.

At the half-yearly meeting of the Wolverhampton Gas Company last Tuesday, the Directors reported a net profit of £6822, and recommended the payment of the usual dividends. The adoption of the report was moved by the Chairman (Mr. Henry Ward), who said the recent reduction of 3d. in the price of gas had caused the balance to diminish; but the Company were really £400 better off than they were in the corresponding period of 1894, had there been no reduction in the charge for gas. Although there was nothing to fear from making the reduction, the Directors did not feel in a position to pay an increased dividend; but they had placed £2000 to the reserve fund. The motion was adopted. In reply to the usual vote of thanks, the Chairman said that three years ago negotiations were entered into for the sale of the works to the Town Council. A favourable offer was made to the Corporation; but it was declined. The Company were still open to an arrangement; but if the Council did not offer fair terms, the amount required would be larger in the future.

Water Companies.

A very satisfactory report was presented at the recent half-yearly meeting of the Exmouth and District Water-Works Company, whose undertaking the Exmouth District Council are desirous of purchasing. The report of the Directors announced a substantial increase in the profits; and it was decided to pay a dividend of £8 per cent. on the original shares, of £5 12s. per cent. on the shares whereon the dividend is limited to 7 per cent., and of £4 per cent. on the 5 per cent. shares. New filter-beds at the service reservoir had been completed; and the water supply for the past five months has been taken entirely from the new source—thus leaving the storage reservoir quite full as a reserve for summer use. The Chairman (the Rev. C. R. Carr) congratulated the shareholders on the decided prosperity of the Company, and on overcoming many difficulties which presented themselves in connection with the water supply, which was now abundant.

Reporting at the recent meeting of the Maidstone Water Company upon the working of the concern during the past half year, the Directors stated that the rental had amounted to £5055; and the sum at the credit of profit and loss account was £5658. The payment of a dividend of 4¼ and 3 per cent. respectively on the 10 and 7 per cent. shares was proposed. These payments would absorb £1910. In the corresponding half year, the dividends were £3 18s. 4d. per cent. and £2 15s. During the six months the Directors had purchased for £5750 a water-rent of Lord Romney, for which they paid a minimum rent of £200 a year; the average rent having been about £240 a year. The report was adopted.

In last week's issue, reference was made to the report and accounts of the Newcastle and Gateshead Water Company. In moving their adoption at the annual meeting of the shareholders last Tuesday, the Chairman (Mr. W. D. Cruddas, M.P.) stated that the increase in the rental during the year had been £3416. Regarding the expenditure, they had spent £8147 in lowering and renewing mains; the large increase arising from the exceptionally severe frost of last winter. Of the £8147, £5200 had been carried direct to revenue account, £1000 to capital account, and £2000 to suspense account. The item of rates and taxes continued to increase, through the raising of the Company's assessments; and it might be necessary for the Directors to take some steps to determine the equitable and just value that ought to be put upon their property. The capital expenditure was very large; and it had been incurred upon the Rede works, the Rede pipe-line, the new filter-beds at Whittle Dene, and the new 30-inch main

from Newburn to Gateshead. The motion was agreed to, and a dividend at the rate of 8 per cent. per annum was declared on the original consolidated stock, and of £5 12s. per cent. on the 1876 stock.

The shareholders of the Sunderland and South Shields Water Company assembled yesterday week to receive the Directors' report and accounts, as noticed last week. In addition to the information then given, the Chairman (Mr. James Stokoe) stated that the capital account, which last year stood at £613,580, was now £618,383. With regard to the revenue account, the working expenditure was £30,845 last year, as against £32,575. The amount secured as water-rents was £70,581, as compared with £70,469. In the profit and loss account, it would be seen that the interim dividend amounted to £15,654; and that the available balance was £45,579, as against £44,791. When the dividend now proposed was paid, they would have a balance of £29,924. He was very sure the shareholders would be glad to learn that the reserve fund for special repairs and renewals had now reached the sum they talked about a few years ago—viz., £20,000. The motion was adopted; and a dividend was declared of 4½ per cent. on the ordinary and preference stock, making, with the interim dividend, 9 per cent. for the year.

The report presented at the recent half-yearly meeting of the Truro Water Company showed that the revenue amounted to £991; and the expenditure, to £457. Out of a credit balance of £505, the Directors recommended that a dividend at the rate of 3 per cent. per annum should be paid, which would absorb £240; and that £250 be transferred to the capital account, and £15 carried forward. The Chairman (Mr. A. C. Willyams) stated that the cost of the water-wheel had now been paid off, and the balance of £1234 against the Company on capital account was about equal to the amount (£1258) spent on the new engine. The Engineer (Mr. Nicholas Trestrail) gave some statistics as to the quantity of water pumped. The new Worthington engine worked 799 hours, and the old engine 14 hours, and pumped 21,687,000 gallons and 252,000 gallons respectively; the total quantity pumped in 813 hours being 21,939,000 gallons, and the consumption of fuel 90 tons. The wheel pumped 4,910,000 gallons. Both Mr. Trestrail and the Chairman bore testimony to the economical working of the new engine. The report was adopted and the dividend declared.

The half-yearly meeting of the Woking Water Company was held last Tuesday. Mr. Charles Horsley, J.P., presided; and referring to the report and accounts, he said he was happy to state that the Company were in a fair and prosperous condition. The total expenditure on capital account was now £81,563. The revenue for the whole of the year was £6194; and the expenses amounted to £2493. The sum of £220 had been written off profit and loss on account of the extraordinary expenditure incurred through the frost. The Directors thought it was not fair that the one year should bear the whole of this charge; and therefore they had written off two-thirds, and left one-third to be paid off in the current year. The balance carried to the profit and loss account was £3700. The amount available for the past half-year's dividend was £1576, out of which the Directors recommended a payment at the rate of 4 per cent. per annum. This would absorb £1494. The working expenses had been less; and rates and taxes were more by £65. On the other hand, the rental had advanced. They had increased the capital by about £3000. He did not think they would want any additional engine power, or any more capital spent in that department; but still they would have to gently continue the work underground—in the way of driving adits, and so on. The Directors did not purpose laying out any more capital than they could possibly help, except it brought in revenue. The revenue had increased by 7 per cent. in a year; and the profits had advanced by 14 per cent. Mr. R. Hesketh Jones seconded the motion, which, after a short discussion, was carried. The dividend recommended was declared; and the retiring Directors (Mr. Jones and Sir John Baker) were re-elected. Mr. Ernest L. Burton was appointed Auditor in the place of Mr. W. Edmonds, who resigned the position prior to election as Director.

At the recent annual meeting of the Wycombe Water Company—Mr. J. G. Peace, J.P., in the chair—the Directors reported a balance of £565 available for division; and they recommended a dividend of 10 per cent., free of income-tax. In moving the adoption of the report, the Chairman gave a brief history of the undertaking, which he said had now reached the top of the tree, for their Provisional Order would not allow them to pay more than 10 per cent. dividend. In 1885, they declared 4 per cent.; so that in ten years there had been a marked improvement. The present result was also exceptionally good, when the shareholders considered the difficulties they had had to encounter; and he thought a great deal of this result was owing to the zeal and energy displayed by their Manager (Mr. J. F. Wicks). They had every reason for confidence in the stability of the undertaking. The report was adopted, and the dividend recommended declared. Votes of thanks having been accorded to the Chairman and the Manager, Mr. Wicks, in reply, said the machinery was all in excellent order, having lately been thoroughly overhauled, the result of which was that a saving was effected in the cost of fuel. The Company continued to supply a good article at a fair price—a fact which was confirmed by an analysis by Dr. Frankland, who said their water was practically the purest sample he had ever analyzed, and that a community supplied from such a source ought to consider themselves highly favoured.

Hastings Water Supply.—At a meeting of the Hastings Rural District Council last Tuesday, a letter was read from the Local Government Board refusing the application of the Council for power to construct new water-works at Ore, because it had been pointed out to them that the position selected for the works was unsuitable, and the water would be liable to contamination from sewage and other offensive matter. They understood the works had already been commenced; and, if that were so, the Council would be responsible for the expense incurred, as application should have been made to the Board before any money was spent in such undertakings. The Chairman (Mr. E. H. Cruttenden) said this move of the Board was a complete checkmate to the Council's scheme. Mr. Thorpe asked if the Board could not be forced to reconsider their decision. The Clerk said they could not. The money spent would have to come out of the current rates as no loan had been obtained.

THE DUBLIN IMPROVEMENT BILL.

The Corporation and the Alliance Gas Company and the Out-Townships.

In virtue of a resolution passed at the meeting of the citizens of Dublin on the 5th ult. (*ante*, p. 295) to consider the Bill which is being promoted by the Corporation to carry out certain improvements in the government of the city, a special assembly of the Municipal Council was held on Monday last week, for the purpose of having an interview with representatives of the Alliance Gas Company and the Commissioners of the outlying townships in regard to the gas and water clauses of the Bill. The Lord Mayor presided. The gas business was taken first; and it opened with the reading by the Town Clerk of a letter addressed to the Lord Mayor by the Secretary and Manager of the Alliance Company (Mr. W. F. Cotton, J.P.), in reply to one from him intimating that he had called a special meeting of the Council, and inviting the Directors to be present with the view of discussing the matters in dispute, and, if possible, coming to an arrangement. Mr. Cotton replied as follows:—

I have laid the letter before my Board, and I am directed to state that for years past they have tried, time after time, to come to a friendly arrangement with the Corporation, but with no good result. All efforts proved fruitless; and we have been from time to time driven to seek redress in the public Courts of Justice, notably in respect to the meters which you placed in the lamp-columns for the purpose of measuring the supply of gas for the public lamps. We called your attention several times to the fact that these meters were not measuring the quantity of gas consumed; and we pressed you to have proper ones substituted. You declined; and we had to institute a suit in the Court of Chancery to compel you to do so. The Master of the Rolls gave a decree in favour of the Company; and in his judgment observed that the meters were actually passing gas without recording it or registering it—in other words, actually cheating, as far as a meter can be accused of felonious offence, the Gas Company of gas which went through them, affecting the calculation for the rest of the lamps that were collocated with them. From the date of that judgment (July 6, 1895) we have pressed you to have the matter set to rights; but up to the present, little or nothing has been done. Day by day the Corporation have assailed the Company in every way, and alleged that the Company, being bound to furnish 16-candle gas to the public, had in reality furnished gas of only 12 or 13 candle power. This was over and over again stated at the meeting held by your lordship on the 5th of February; and I regret to say that you personally reiterated it. From time to time the Company have pressed the Corporation to have this question of the quality of the gas supplied tried in a public Court of Justice. It was in their power to have it so tried in precisely the same way as similar questions are tried in England. But the Corporation, instead of doing so, continued to publicly make these unfounded allegations of fraud against the Company. You have now promoted a Bill in Parliament, ostensibly with the view of having the various matters decided. You have furnished me with a copy of that Bill, many of the clauses of which would practically tend to confiscate the Company's property. Under these circumstances, my Board feel that it would be out of place to attend a meeting of your Council, as, from past experience, they are of opinion that no good result would follow. The Corporation have now of their own action referred the matter to the highest tribunal of the land—the Court of Parliament; and my Board think it is better, in the interests of justice, that that high body should be left to decide the matter.

The Lord Mayor said he thought it was a pity that the Company did not see fit to come forward and meet the Corporation in a friendly spirit, which he certainly expected they would do. It would be at once seen that the Corporation had done their part, and were driven to go to Parliament and incur very great expense to compel the Company to give them the light they were entitled to and had not had. As to the water question, he was glad to say that the Dalkey, Killiney and Ballybrack, and Kingstown Commissioners had been good enough to accept the Corporation's invitation; and representatives were present to discuss the question with them. Mr. Lenehan remarked that the Gas Company's letter should be first disposed of. Alderman Flanagan thought no action should be taken on the letter, except to enter it upon the minutes as read. There was no opening for discussion on the gas question at all. The letter was a complete challenge to the Council. Alderman Dillon said it should not be taken that the statements made in the letter were incapable of refutation. The Corporation would have an opportunity of discussing the matter before Parliament. Alderman Meade thought the letter was sufficient justification of the action of the Council in promoting the Bill. It showed that there was no intention on the part of the Company to meet the Council in any friendly discussion. The subject of the water clauses of the Bill was then taken up. With regard to the Pembroke Commissioners, their Secretary (Mr. J. J. Manly) replied to the Lord Mayor's letter of invitation that there were no matters in dispute between the Corporation and the Commissioners in regard to water supply. Since 1868, when the supply commenced, the Commissioners had loyally paid for all water taken from the Corporation (including the year 1893, when the Corporation were unable to furnish a full supply) something like £60,000; and although this had been the case for the past 28 years, the Commissioners had several times, without any justification so far as the township was concerned, been brought before Parliament, at vast expense, to protect their interests. The Commissioners regretted that they were now compelled again to go to Parliament at a large further outlay; but, having regard to the facts above stated, they had no alternative but to seek to be released altogether from their obligation to take water from the Corporation. Under these circumstances, the Commissioners did not see what good purpose would be served by attending the conference on the subject of non-payment for excess water by certain of the townships. As to the Blackrock Commissioners, their Secretary (Mr. Finlay) wrote that they did not see their way to attend the meeting, as they could not believe that any advantage would be gained by it, as it would be impossible to discuss all matters of difference between the Corporation and all the townships at such a meeting. If, however, the Corporation would depart from the hostile position they seemed to have adopted in framing the Bill, and would submit a proposal to the Commissioners, they would fully consider the matter, and endeavour to meet any just claims of the Corporation; or if the Corporation would appoint a small Committee, with full powers to compromise all

matters in dispute, the Commissioners would appoint a similar Committee, with like powers, to meet them. The Lord Mayor said he thought the letter from Blackrock was very unfortunate. The desire of the Corporation was to meet the townships in a friendly manner; and he was sorry Blackrock did not take it in that sense. The deputations from Kingstown, Bray, Dalkey, and Killiney and Ballybrack were then admitted; and the discussion proceeded with open doors. The Lord Mayor said the complaint the Corporation made on the subject of the water supply was as to the townships consuming any water above the agreed 20 gallons per head per day without paying the Corporation for it. It seemed unreasonable that some of the townships should be at liberty to consume from 15 to 40 gallons per head per day beyond the 20 gallons they paid for. The terms insisted upon by the Corporation were clearly set forth in the Bill, with which they would have to go before Parliament if the townships did not meet them liberally. He called upon the representative of Bray, who said he was unprepared to make a proposition. Mr. W. Wallace, the Chairman of the Water Committee of the Kingstown Commissioners, said if any change was to be made, the Kingstown people wanted it to be of a character more favourable to them than the present conditions. They did not wish to be bound in perpetuity; they wanted a clause to terminate the contract at twelve months' notice. Their view was that they were under no obligation to the Corporation, to whom they had given a full equivalent for what they had received. The Lord Mayor pointed out that the supply to Kingstown should be 20 gallons per head. On the 8th of January, they had 15 gallons extra; on the 22nd, 15 gallons extra; on the 29th, 16 gallons extra; and on Feb. 5, 17 gallons extra. He thought the Corporation were treating the township very liberally. Mr. Wallace said they disputed the figures; and, in any case, they asserted that they were made out on a false statutable estimate of 20 gallons. Captain Stewart, representing the Dalkey Township Commissioners, said they would suggest for the consideration of the Corporation that the terms proposed in last year's Bill be renewed to them—viz., 25 gallons of water per head of the population, with an additional supply of 20 per cent. during the months of July, August, September, and October, when there were a large number of summer visitors; also that the accounts for additional water should be made up annually, and that charges for an excess supply should not exceed the rate paid at present for a statutable supply—say, 2½d. per 1000 gallons. Mr. Graham, on behalf of the Clontarf Commissioners, said their position was unaltered. They thought they were paying too much at present. After some further remarks, it was decided to refer the matter to a Committee of the Whole House, with power to them to confer with representatives of the townships.

DARLINGTON CORPORATION GAS-WORKS.

The Proposed Extensions—An Appeal to the Local Government Board.

A Special Meeting of the Darlington Town Council was held last Thursday for the purpose of discussing minutes presented by the Gas Committee, recommending that application be made for a Provisional Order giving powers to borrow £25,000 for the extension of the gas-works, and that Mr. C. Hawksley be called in to advise the Committee as to the extensions. A portion of the minutes relating to the enrichment of the gas, it was proposed, should stand over until the members of the Council had had more time to consider the question.

Alderman BARRON, the Chairman of the Committee, moved the adoption of the minutes. He said that, as the Council were aware, when the late Bill was not approved of by the ratepayers and the demand for a poll was withdrawn, the Council were left in the position of not having any legal standing to proceed further with the Bill. A letter was sent to the Local Government Board asking them to deal with the necessities of the gas-works, which had become urgent, by way of a Provisional Order. They received a formal letter from the Department informing them that the time was now past for applying for an Order this session. However, through the instrumentality of Alderman Arthur Pease, he had had an interview with Mr. Adrian, and subsequently with Mr. Dalton—two of the Assistant Secretaries of the Board. He set forth to them what they considered to be the position of the Gas Committee with regard to the supply of gas to the town, and pointed out that for immediate purposes it was absolutely necessary they should be allowed by some process, if it could be devised, to go on with the purchase of land, to borrow the money for the payment of the land, and to erect a gasholder such as he indicated was required in the report which he had prepared (see *ante*, p. 297). Mr. Adrian and Mr. Dalton were good enough to suggest that if the Committee could show the emergency, there were certain processes known to them by which possibly an application might not be considered too late for acceptance. On this, the Committee had a meeting on Feb. 15, and passed the resolutions contained in the minutes. During the previous week, the Committee had decided to erect the holder next to the railway; and they had practically come to an arrangement in regard to wayleave with the Railway Company, and for the extension of the depôts for coal storage. By means of the proposed Order, they now hoped to get the relief they required for immediate purposes, though it must not be thought they were in any way certain of obtaining it.

The TOWN CLERK said the motion would be: "Resolved that application be made to the Local Government Board for a Provisional Order to extend the section of the third schedule, part 2, of the Darlington Extension and Improvement Act (1872), so as to include a piece of land 3 acres 2 roods and 30 perches or thereabouts, for the purpose of enabling the Corporation to use that land, or any part thereof, for the purposes of their gas undertaking, and for sanction to borrow £25,000 for gas-works purposes."

Mr. WALLIS seconded the motion.

Alderman BARRON, replying to questions, said the £25,000 was made up approximately as follows: Land and boundaries (fencing), £3000; gasholder and tanks, £13,000; extension of coal depôts, £2500; scrubbers and new boiler, £1000; and extension of retort-houses and new retorts for immediate purposes, £4000. These items made a total of £23,500. There was £1500 left for gas-stoves and contingencies.

The motion was adopted.

ELECTRIC LIGHTING NOTES.

Much to the consternation of the worthy vestrymen of Hampstead, the arc lamps in the Finchley Road still refuse to perform their allotted functions. Readers of the "JOURNAL" will recollect that some time ago these lamps were relegated to the temporary care of the authors of their being—Messrs. Siemens—for a two months' trial; but they have proved obdurate even to the blandishments of their own creators. On Thursday, therefore, the Committee recommended that Messrs. Siemens be informed that the Vestry are not satisfied with the working of the lamps during their two months' trial; that they are going fully into the matter; and that they will be in a position to communicate with them further on the subject shortly. The Vestry sustained this recommendation with but little comment; but the unanimity of the meeting was rudely dispelled when a further resolution, that the tender of Messrs. Siemens for the supply of carbons for one year from the 26th inst. be accepted, was submitted. This was too much. Mr. Richardson thought such action would be wrong, inasmuch as the Vestry are not satisfied as to the working of the lamps. He moved that the matter be referred back to the Committee for further consideration. The member who seconded the motion naively suggested that this was an excellent opportunity for changing the carbons, if not the lamps. Mr. Watts dolefully asked what might be expected in the future, if the past two months' trial was unsatisfactory. Mr. G. H. Cottam (the Chief Electrical Engineer) explained that the manufacturers had complained last season that the lamps had been used with carbons other than theirs, and would burn better with their own carbons. The lamps, therefore, had now been adjusted to suit the latter; and he (Mr. Cottam) thought it would be unwise to make a further change. Mr. Johnson retorted that, if this contention was correct, the Vestry would have to buy their carbons from this firm to the end of the chapter. He wanted to know how many other carbons had been tested. Mr. Cottam replied that during last summer six or eight different kinds had been tried; but none recently. Eventually, the question of the contract was referred back as per amendment; a further amendment, that a sufficient quantity of the present carbons should be purchased in order to test the lamps, and that no contract should be entered into until the termination of this test, being lost. A member tried to "draw" the Chief Electrical Engineer by asking him if he was personally satisfied with the present condition of these lamps; but he warily replied that he would much rather the Committee answered the question for themselves. More trouble arose when a recommendation that two boilers should be ordered from Messrs. John Brown and Co., of Sheffield, at the price of £3500 came up for discussion. Mr. Dobbs maintained that such a large expenditure should not be made before the electric lighting accounts had been submitted to the Vestry. It was a very easy matter to borrow £10,000 or £20,000 on the security of the rates. He moved that no contract be entered into until the accounts for the past year's working had been published. Mr. Johnson seconded the motion; but Mr. Richardson thought it was wise to look ahead. After Mr. Thwaites, the Chairman of the Electric Lighting Committee, had declared that, unless the Vestry had made up their minds to stop business in the autumn, these boilers must be had, the amendment was lost by a large majority. Before the electric lighting question was done with, the Engineer was instructed to report to the next meeting *re* the arc lamps referred to above; and an explanation of the failure of the light in the Vestry Hall and Board Room on the previous Friday evening was demanded. It appears that those terrible "fuses" were at fault; and the Chairman of the Committee promised that such a thing would not occur again. After this reply, what could the Vestry do but let the Chairman off?

The shareholders of the Electric Lighting Company at Preston are well satisfied with the progress the concern is making. In 1893 the income was £3345, and the expenditure £4345—a loss of £1009. In 1894, the totals were respectively £4778 and £3783—a reduction in expenses of £571, and a profit of £995. Last year the income was £5739, and the expenditure £3339—a reduction in expenses on 1893 of £1016, and a profit of £2401. No dividend, however, is to be declared for the past year. The Corporation, it is said, have decided to light most of the public thoroughfares and streets with electricity; so that altogether, it is believed, there are indications of progressive value in the Company's property.

A public meeting of the ratepayers of Maidstone was held last Friday week, to consider the question as to whether or not the Council should dispose of their electric lighting powers to a private Company. Almost unanimously, they agreed that it would be unwise and inexpedient to do so, and suggested that application should be made by the Council to the Board of Trade for an extension of the Order for twelve months. At the meeting of the Council on Wednesday, a report presented by the Electric Lighting Committee in January, recommending the transfer of the Order to a private Company, came up for consideration; but in view of the result of the meeting of ratepayers, it was referred back.

In the "JOURNAL" for Dec. 24 last, we recorded a fatal accident to a workman named Pugh, employed by the Electric Lighting Department of the Cheltenham Corporation. The matter was exhaustively investigated by the Coroner's jury at the time; and a verdict of "Accidental death" was returned—no blame being attached to anyone. The accident was also inquired into by Major Cardew, on behalf of the Board of Trade; and his report has lately been issued. He states that Pugh was at the time boring a hole in a wooden batten with a large gimlet, at a distance of only about 4 inches from the high-pressure switchboard, on which were fixed several switches, with exposed metal surfaces, charged to the full pressure of 2000 volts. The danger was, he considered, almost equal to that of sending a man into a magazine full of loose powder with a lighted candle in his hand. Before the accident, Pugh had been cautioned several times. Major Cardew thinks that the accident is chiefly to be attributed to an error in judgment on the part of those responsible in allowing such work to be carried on in close proximity to highly-charged metal. The electric pressure is switched off altogether on Wednesdays for two hours in the middle of the day; and the work could have been carried out with

absolute safety during this interval. Under ordinary conditions, no work other than attention to the electrical circuits should be carried on in any transforming station when any apparatus contained therein is charged to a high pressure. The switching arrangements on the high-pressure switchboards in use in this and other transforming stations are needlessly dangerous, inasmuch as large surfaces of charged metal are exposed which could easily be covered by solid insulating material, so as to render accidental contact with them impossible. In all the transforming stations, a thoroughly insulated floor should be provided. The india-rubber mats should be retained as an additional precaution. There should also be, in every case where it can be arranged, a stout wooden rail or other division to separate off the portion of the chamber where high-pressure apparatus is fixed.

The unfortunate Morecambe Electric Light Company is to be voluntarily wound up. The unsuccessful career of the concern is attributable to inadequacy of capital, to the result of proceedings at the instance of residents in the vicinity of the generating station for nuisance caused by the emission of noxious vapour from the motive power employed, and "other unforeseen difficulties." An extraordinary meeting of the shareholders was held last Thursday, in consequence of a petition in bankruptcy lodged by the Bank of Liverpool, who intimated their willingness to withdraw this if the Company decided upon voluntary liquidation. This the shareholders were pleased to do. It is understood that the District Council have agreed to purchase the undertaking if they can obtain the approval of the ratepayers and sanction of the Local Government Board.

On the subject of the electric lighting of their district, the ways of the District Council of Llandrindod Wells are somewhat peculiar. Some time ago, they entered into negotiations with Messrs. Jevons and Thomas, of Birmingham, for the introduction of the electric light into their district. The matter went so far as the engrossment of an agreement with them; and it seemed as though nothing was wanting but an opportunity for signing it. Before this could be done, Mr. E. Davies, of Llandinam, appeared on the scene, and told the Council that he was prepared to form a Company for the general improvement of the town, but mainly for lighting it by electricity, and that the inhabitants would have an opportunity of taking shares in the concern. He was willing to undertake to light the streets by means of 32-candle power lamps at 40s. each per annum, as compared with 58s. 6d. under the proposed contract with Messrs. Jevons and Thomas; while current for private lighting would be supplied at 6d. per unit, as against the 7d. and 8d. proposed to be charged. When putting these figures before the Council at their last meeting, the Vice-Chairman said the members were in somewhat of a strait, for they could not with credit get out of the agreement with Messrs. Jevons and Thomas, but at the same time there was an extraordinary difference between the two prices. He added that when a Welshman's pockets were touched, it went very near his heart. He compared the price per unit of electricity with the charge for gas; and he gave 4s. 6d. per 1000 cubic feet as the equivalent of 8d. per unit, and 3s. as the equivalent of 6d. These figures may go "very near the heart" of Mr. W. H. Preece; but we are afraid other Welshmen will find by experience that they will not work in practice. At all events, the outcome of the affair was that when Messrs. Jevons and Thomas presented themselves before the Council prepared to carry out their part of the contract, they were coolly told that the Council considered it undesirable to enter into the proposed agreement, and that it was unlikely they would do so at any future date. Mr. Davies was subsequently informed that his scheme had been practically adopted, but not legally until the resolution with reference to Messrs. Jevons and Thomas had been rescinded.

Very strong opposition has been excited by the electric lighting proposals of the Torquay Corporation. A public meeting of the burgesses of one of the wards has already unanimously condemned the scheme as needless and costly, and as likely to be a burden upon the rates; while a movement is on foot with a view to a canvass of the town against the scheme, with the ultimate object of opposing it at the Local Government Board inquiry. In the local press, the condemnation is practically unanimous, though the reasons for it do not altogether agree. No doubt, the most general fear is that the adoption of the electric light means an addition to the rates. But there is also a strong feeling that the movement is inopportune at the present time, when other and, as it is thought, more pressing schemes ought to be carried out. Another objection is to the site which has been selected for the central station. One of the local papers is confident that the general body of ratepayers view the decision of the Town Council "with regret, if not with dismay;" another speaks of it as having been received "with considerable surprise;" while at one of the meetings at which reference has been made to the subject, it was said that the action of the Council "came as an electric shock to the burgesses." The fact is the town has never seriously considered the proposal, and has certainly not made any demand for the electric light. It is true that the Corporation have had the subject under consideration for five years. But they have never seemed to approach it in earnest; and apparently nothing could more have astonished the burgesses than the fact that a majority of their representatives have come to a decision in favour of electric lighting. "A purely problematical and very hazardous undertaking" is one characterization of it. The present scheme is larger and more costly than that contemplated when Mr. Trentham first reported three years ago; and this is not a point in its favour with its opponents. Originally the capital cost was to be £17,403; the annual charge for redemption of debt and for maintenance, £3100; and the revenue, £3320. Now the estimated cost for a wider area is £22,288; and the estimated revenue is put at £4491. Very grave doubt is expressed as to anything like this income being realized; and Mr. Trentham's assurance that his report was based on fact and not on assumption is cleverly turned against him in reference to this particular item. As to the details of the scheme, it is inquired how it comes about that 16 arc lamps and posts for street lighting were to cost £800 three years ago, while to-day 70 are put down at only £1260. As to price, it is argued, and rightly, that, in spite of Mr. Trentham's assurance, electric light at 6d. per unit is, and must be, considerably more expensive than gas at 3s. per 1000 cubic feet—the price in Torquay. In fact, there is no detail of the scheme which is not being vigorously attacked.

METROPOLIS WATER SUPPLY.

The London County Council and the Water Question.

At the Meeting of the London County Council last Tuesday—Sir A. ARNOLD in the chair—the report of the Water Committee on the proposal to bring a supplementary supply of water to London from Wales, was under consideration. It will be remembered that the Engineer (Mr. A. R. Binnie, M.Inst.C.E.) had prepared an elaborate scheme of auxiliary water supply, which was fully noticed in the last volume of the "JOURNAL." He indicated therein five main sources—viz., the valley of the Usk and Llangorse, the Edw, the Ithon, the Upper Wye, and the Yrfon and Towy; the estimated total cost of the 415 million gallons of additional water which would be furnished being £38,772,250. The Committee personally inspected the sources suggested, and decided to recommend the Council to sanction the carrying out of the portion of the scheme comprising the Llangorse and Usk reservoirs, with a conduit to Elstree, which will provide 182 million gallons of water a day at an estimated cost of £17,462,750. They therefore brought up the following recommendation:—

That the Council do approve the following conclusions: (1) That it is in the interests of London that the requisite augmentation to its supplies of water should be derived from some source other than the Rivers Thames and Lea. (2) That the valleys of the Usk, the Wye, and the Towy, with their tributaries, furnish the most suitable area from whence such supplies should be derived. (3) That the Usk and Llangorse section of the Welsh scheme should be undertaken in the first instance. That the Water Committee be instructed to continue the surveys of the whole of the Welsh scheme, and to prepare such plans, &c., as are necessary in order to enable the Council to apply to Parliament in the session of 1897 for powers to carry out the Usk and Llangorse section of the scheme, together with the requisite conduit to London, and for powers to purchase such sites for reservoirs and such other rights as may be necessary in order to ensure that the other areas referred to shall remain available for the supply of the Metropolis.

The Committee further asked to be authorized to spend £10,000 in relation to this matter.

Mr. IDRIS (the Chairman of the Committee), in moving the reception of the report, said it might be urged that the Thames water was pure enough and abundant enough to last for the next fifty years; but the supply from Wales was much purer, and was sufficient for five times fifty years. They must, he contended, have fresh supplies; and it was far cheaper to go to Wales than to any other source.

Mr. WESTACOTT appealed to the Chairman of the Committee to withdraw the report for three weeks, in order that the Council might know the course the Government proposed to take on the water question.

Mr. IDRIS said he was unable to accept the suggestion. The report had been adjourned from time to time; and he hoped a decision would be come to that day.

Mr. WESTACOTT then moved to adjourn the reception of the report for three weeks.

The motion, on a show of hands, was rejected. The report having been formally received,

The Earl of ONSLOW moved the following amendment to the first recommendation: "That it is in the interests of London that provision should be made for augmenting the supplies of water to meet the needs which may ultimately be felt by securing some source in addition to the Thames and Lea; that the valleys of the Usk, the Wye, and the Towy, with their tributaries, furnish a suitable area, from some part of which such supplies might be derived; but that, inasmuch as Her Majesty's Government has given notice of legislation on the question of the London Water Supply, it is inexpedient to incur further expenditure until the views of the Government be known. That the Committee do therefore report further on the question this day three weeks." He denied that there was any great urgency in proceeding at once to bring a supply of water to London from any distant source. He ventured to think that the Committee and the Engineer had been dazzled by the magnificence of this great scheme. He was not prepared to give up the Thames as the source of water supply for London. He was ready to admit that, if an additional supply could be obtained from Wales, or anywhere else, at a cost not greatly exceeding what would have to be spent on a system of storage reservoirs, then he should certainly be in favour of bringing it from Wales. The Council should not, however, proceed in the matter with too rapid strides. It was clearly not necessary for them at once to convey water from Wales. He could not conscientiously vote for anything more than securing for London, in order that no other place might step in, the area which they might be advised by Mr. Binnie and other engineers was the best from which London could derive an additional supply.

Dr. WHITE, in seconding the amendment, said he had visited the district suggested; and though it was a capital place for trout, he was not prepared, on the personal inspection of the members of the Water Committee, who were not experts on the question, to commit London to an expenditure of £38,000,000.

Mr. J. STUART, M.P., said if the question must be postponed, it was not necessary to take that course with the entire report; and he therefore proposed that the first two recommendations should be adopted, and consideration of the others adjourned.

Mr. E. BOND, M.P., considered that for years to come Londoners would have to rely on the Thames and Lea. Was the Welsh water to be blended with the present supply from suspected sources, or was it to be reserved for drinking, and the other used only for road watering?

Lord TWEEDMOUTH pointed out that the amendment was not only ingenious, but disingenuous. It was not proposed at all to give up the Thames supply; but the first step towards coming to terms with the Water Companies was to take possession of fresh districts. He urged the Council to come to a vote upon the main question.

Mr. BEACHCROFT moved the adjournment of the debate; but the motion was lost on a division.

Mr. COSTELLOE said if, as Lord Onslow had told them, the Government between now and three weeks hence were going to make some declaration, let them accept the first of the two recommendations of the Committee, and adjourn the rest. The whole point of the debate turned upon the relation between the Welsh scheme and that which

was now before Parliament on the part of the Water Companies—the Staines scheme. No one would be found to deny that at an early date an additional supply of water must be secured, and that the parliamentary powers for the engineering works necessary for that supply must be obtained at once. The Water Companies proposed to meet the need by the provision of storage reservoirs, which would hold water taken from the Thames. The Council had unanimously decided to oppose this scheme. But now, by a subtle difference of words, many Moderates appeared to be inclined to hark back from that position; and the whole difference between the proposal of the Progressives and Lord Onslow's proposal turned on that point. If they meant to beat the Water Companies on the Staines scheme, it was necessary that the Council should speak with no uncertain and halting voice, but have the courage to make up their minds as to what they meant to say to Parliament, and say it. As he understood it, Lord Onslow told them he was not prepared to say there might not be a storage system in the valley of the Thames or the Lea. If the Council came to this decision, how could they fight the Staines scheme? They could only successfully fight that scheme if they said to Parliament as much as the Water Committee had said; and if they failed in their opposition to the Staines scheme, they would be mortgaging the water of the Thames and the Lea to the existing Companies for fifty years.

Mr. L. HOLLAND, M.P., moved the adjournment of the debate; and, on a show of hands, this was agreed to.

After some further discussion,

The Joint Parliamentary and Water Committee reported that by the Kent Water Board Bill it was proposed to constitute a Water Board which should purchase the undertaking of the Kent Water Company and the portion of that of the Lambeth Company which is situated in Kent. Provision was also made for the transfer of the powers of the Board to the London County Council. The Committee recommended that the Kent authorities should be informed that the Council will not oppose the Bill on condition that satisfactory arrangements are arrived at with respect to the financial questions involved, and as to the sources of supply; and that to secure such satisfactory arrangements, a petition be presented against the Bill.

Mr. BEACHCROFT moved, as an amendment, that the Council should petition against the Bill, on the ground that it intrenched on the Council's water projects.

Mr. H. P. HARRIS seconded the amendment.

After some discussion, the amendment was rejected on a show of hands, and the recommendation of the Committee was agreed to.

LANCASTER CORPORATION WATER SUPPLY.

The Local Government Board and the Blea Tarn Scheme.

At last Wednesday's Meeting of the Lancaster Town Council, the Mayor (Alderman Huntingdon) made a statement as to the finances of the Water Department; mentioning, among other things, that the reserve fund had been made up to £12,000, which was the maximum that could be held. Proceeding, he said a serious matter for the Committee had arisen in connection with the Blea Tarn scheme. So far as they knew, they had obtained all the necessary powers and the sanction of the Local Government Board for carrying out the scheme. The matter had been under discussion for a long time. In November, 1894, formal application was made to the Local Government Board; and in December following an inquiry was held by two Inspectors, when the matter was fully gone into. There was practically no opposition to the scheme; and on May 30 last year, a Provisional Order was obtained. They were now, however, on making a formal application to borrow the money, told that the inquiry would be re-opened, and an Inspector would be sent down; and he (the Mayor) did not know whether the whole thing would not be entered into again. Some alternative scheme might be discussed; and the Corporation might be called upon to prove what they had already established, and to fight for what they had already procured. The Committee could not understand the action of the Local Government Board; and a deputation had been appointed to wait upon that body, to see what could be done in the matter. Alderman Smith referred to the unexpected obstacle put in the way of the Blea Tarn scheme by the Local Government Board, remarking that the only thing the Committee could find was that the Board had an affection for Thirlmere water. The matter was put before the Committee; and the comparative merits of both schemes were fully debated. It had been shown beyond any question whatever that there was no comparison on financial grounds between the two schemes; and yet for some reason or other, the Local Government Board seemed to wish the Lancaster Corporation to take Thirlmere water instead of utilizing their own supply. On the ground of finance, the Corporation would be enormous losers by adopting the suggestions which the Board were trying to press upon them. The Corporation were now only asking for what was regarded as a formal Order, yet they were met with this obstacle. The proceedings of the Committee were confirmed.

ST. PETERSBURG WATER-WORKS COMPANY, LIMITED.

The Ordinary Meeting of this Company was held last Tuesday, at the Cannon Street Hotel—Mr. W. T. WESTERN in the chair.

The report and accounts (which were noticed last week) were taken as read.

The CHAIRMAN moved their adoption, and the declaration of a dividend of 4s. 6d., making, with the interim dividend, 7s. 6d. for the year. He remarked that the report was a short one, for the good reason that they had passed through a very uneventful year. The Municipality had paid them the annuity punctually; and they had brought it over to this country into sterling at a rate of exchange very nearly the same as in the previous year—about 1 per cent. lower. The Directors had carried out the proceedings for the reduction of the capital authorized at the meeting of the shareholders in the spring of last year; and they would find this given effect to in the accounts. After making allowance for these special expenses, and providing for interest on the debenture debt, and for the sinking fund, the profits were £4823. Then, after writing off the adverse balance of £691, and paying the dividend recommended, there would be a small balance to be carried forward. The question of the redemption of the annuity by the Municipality was still *in statu quo*. During the year, they had discharged "A" debentures to the extent of £7800—reducing the amount outstanding to £31,900. They had also given notice to pay off £2800; so that this class of debentures was rapidly approaching extinction.

Mr. R. S. GUINNESS seconded the motion, which was agreed to.

On the proposition of the CHAIRMAN, seconded by Mr. A. F. H. DARLEY, Mr. Guinness and Lord E. S. Churchill, the retiring Directors, were re-elected; and afterwards the Auditors (Messrs. Cooper Bros. and Co.) were re-appointed.

The CHAIRMAN, replying to a question as to whether the 7 per cent. debentures could not be redeemed, and 4 per cent. debentures issued, said they could not under the circumstances. They had clearly to first redeem the "A" debentures.

A vote of thanks to the Chairman and Directors terminated the proceedings.

NOTES FROM SCOTLAND.

From Our Own Correspondent.

Saturday.

The Edinburgh and Leith Gas Commissioners met on Monday. They had not before them the report by Professor Crum Brown upon carburetted water gas, although I believe they have received it. I have heard what its purport is; but my information was not derived in a way which entitles me to lay it before your readers, so we must wait. I do not expect that a report such as this must be, will be made public, because it would scarcely be fair that, in order to satisfy the Gas Commissioners of Edinburgh and Leith, the nature and properties of gas supplied in other towns should be inquired into and the results made known. If Professor Crum Brown's researches are made public, his analyses can, or should only be by numbers; the names of the places being suppressed.

It is satisfactory to see the growth of business of the Commission. The Engineers reported an increase in the output of gas during January of 3,678,000 cubic feet over that of the corresponding month of last year; and an increase since May 15 of 59,486,000 cubic feet over the output in the corresponding period of last year. On account of this great rise in the consumption, not only are the works being taxed to meet the demand, but the distributing mains have fallen behind the requirements. In the south side of the city particularly there is great want of gas felt; and the Works Committee brought forward a proposal to lay a new trunk main direct from the works to the district, at a cost of £13,000. One member thought they should delay, because there was a very strong desire to introduce the electric light. Happily, Lord Provost M'Donald is a gentleman of great good sense; and he, living in the district, came to the help of the Committee with the statement that in his own small dining-room he did not get the light of one burner from three. Bailie Kinloch Anderson, too, very opportunely pointed out that, unless they were prepared to supply gas, they would play into the hands of promoters of electric lighting. The proposal of the Committee was agreed to.

The Commission then took up another subject, which is of equal importance. There is a large and powerful Trust in the City of Edinburgh, known as the Heriot Trust, who are owners (or superiors) of a great deal of ground property. One of their fields in the west end of the city has been lying unfeued, because of the want of proper access to it. The Trust have now obtained parliamentary powers enabling them to offer it for feuing purposes. They have resolved to first of all construct the roads which will afterwards be the streets in the district; and in the plenitude of their generosity, they concluded that it would be better that water and gas pipes should be laid in the roadways before they were formed. They accordingly requested the Gas Commissioners to lay their mains. The estimated cost of the work, as stated by Mr. R. Mitchell, would be £1193. The Works Committee were equally divided on the subject, and referred it to the Commission. In the Commission, Bailie Kinloch Anderson strongly opposed the proposal, on the ground that they had no guarantee when this land would be taken up. It might be fifteen years; and if so, the Commission would be deriving no revenue upon money which they had laid out. If they were to grant the request of the Trust, others would require similar accommodation; and the result might be that they would have £30,000 or £40,000 lying unproductive in gas-mains which would be all the time deteriorating. He proposed that they lay the pipes on condition that the Heriot Trust should pay a percentage on the cost for whatever proportion should in any year not be in use. I should have considered this to be unanswerable; but Lord Provost M'Donald (his good sense apparently deserting him for the moment) proposed that they lay the pipes; and he added that there was no fear of the ground not being all taken up at once—indeed, they had an offer for the whole of it already. He also used the argument, which I did not consider of a very high character, that the Heriot Trust could build a house at every corner of the ground, and thus compel the Gas Commission to lay their pipes. In the end, the Commissioners adopted the Lord Provost's proposal by 10 votes to 8; thus putting themselves in a false position, so far as good financing goes.

A letter was received from the Directors of the Ratho Gas Company stating that they would be willing to enter into negotiations for the disposal of their undertaking to the Commissioners. The suggestion is impossible, as Ratho is beyond the limits of supply under the Commissioners' Act. It is proposed to considerably extend the boundaries of Edinburgh; but not so far as Ratho, which is nine miles out. The letter was, however, out of courtesy, sent to the Works' Committee.

The Gas Commissioners of Falkirk are, considering the crowded state of their works and the growing nature of their business, exercising

a wise judgment in looking out for another site upon which to erect gas-works. This action has been taken on the recommendation of the Manager, Mr. P. B. Watson. When the Corporation procured their Act of Parliament, they scheduled two pieces of ground on which works might be erected; but unfortunately these have now been found to be unsuitable, because of running sand. A third place was tried; and it proved to be everything which could be desired, there being blue clay to a depth of 36 feet. The misfortune in this case is that the ground was not scheduled; and the Commissioners therefore could not manufacture gas upon it. This result is disappointing; but it may be overcome by getting statuory authority when that is necessary.

The Perth Gas Commissioners are getting into a tight place. They have allowed their borrowing powers to become nearly exhausted; and they are in urgent need of more gas storage accommodation. To get themselves out of this difficulty, the Works Committee applied to the agent of the Bank of Scotland in the city, who replied that his Directors were prepared to grant the Commissioners a loan of £10,000 on overdraft; the amount to be drawn in sums of not more than £1000 at a time. This offer the Committee resolved to accept; and its approval was moved at a meeting of the Commission on Monday. In laying the subject before the Commissioners, Mr. Alexander explained that they bound themselves and their successors in office to repay the loan, and also to make application in the ensuing session of Parliament for an Act authorizing them to erect a new gasholder and execute other works; the Act to contain borrowing powers sufficient to cover the amount of the advance. There was some approach to grumbling by three members at the element of personal liability which enters into the proposed loan; but opposition was not pressed on that score, though delay was moved. The recommendation of the Committee was agreed to; and the Manager was instructed to prepare plans and specifications for the new holder. I suppose the "other works" referred to will include the transference of the gas-works to a new site—a subject which has not been heard of for some time, but which must soon be taken up again, unless the Commission have abandoned the proposal, which is not likely.

Parties were heard by Sheriff Robertson at Forfar on Thursday in the somewhat peculiar application by Provost Vallentine and two others to have the Brechin Gas Company interdicted from cutting off the gas supply. The Solicitor for the Gas Company asked that the interim interdict should be recalled, and the application refused. The Company, he said, was simply a commercial concern, and did not contract to supply gas of any standard or candle power. They offered to consumers the gas which they might produce at their works. The pursuers objected to pay for the gas because, they said, it had been of bad quality; but if this was so, they should have stopped using it. The pursuers wished the Company to take less for their gas than it cost to produce. If this were allowed to go on, and interdict were granted in the present case, people might refuse to pay for gas because it was bad; and the Company would not be allowed to stop supplying them. The Solicitor on the other side, who is also one of the pursuers, asked for a proof. He contended that the Brechin Gas Company were a semi-corporate body, and had undertaken to supply gas to any person or persons in Brechin willing or desirous to contract with them. He and the other pursuers were desirous of contracting; the only condition being that the contract should be subject to the law of Scotland regulating civil contracts. The Company had charged 4s. 7d. per 1000 cubic feet for a superior article; and an inferior article inferred a lower price. He quoted a letter from one of the Directors of the Company, admitting that the gas for a time had been under the standard. Mr. Thomson, replying for the Company, gave figures to show that the gas had never been lower than 24-candle power, and that it had been as high as 27; while according to the statute, the minimum was 14-candle power. The Sheriff took time to consider his judgment.

I have before mentioned the position of a loan which was granted to the Harbour Trustees of Arbroath in 1877, and which was secured upon the profits derived from the Corporation gas undertaking. The "Common Good" of the burgh was the first security, and the gas profits were conditional on its failure. As a matter of fact, there has been no revenue from the "Common Good" for a number of years; and the gas profits have only amounted to a few pounds a year. The harbour, which has been a costly affair to construct, is unable to maintain itself; and, on account of being overloaded with capital, the dues are high—being about double what are charged in Aberdeen and Montrose, the nearest ports. As a consequence, trade is diminishing at the harbour; and the prospects for the holders of stock are getting gloomier. In these circumstances, a scheme of reconstruction—one of those drastic proposals with which we are familiar nowadays—has been prepared, and is likely to be accepted. I need not enter into the details of the scheme; but so far as the loan which was secured upon the gas profits is concerned, the proposal is that it shall be held as a valid burden on the gas undertaking, to the amount of £250 a year, which will remain until the principal sum of £4500 is paid off, with 3 per cent. interest upon it. This iniquitous burden upon the gas profits, which should never have been imposed, may result in an increase in the price of gas, and likely will; but, objectionable though it be, the predecessors of the present municipal representatives have made the bed, and present holders of office—or rather the consumers of gas—must lie upon it. Why do not the Town Council put up the charges under the "Common Good" to at least cover one-half of the burden?

The Edinburgh electric lighting installation is still being kept forward. At a meeting of the Royal Scottish Society of Arts on Monday night, Mr. E. Monkhouse, the City Electrical Engineer, read a paper on the distribution of electricity in Edinburgh. Lord Kingsburgh, at the close, asked what consumers who had already wired their houses were to do with their lamps when the voltage was increased to 450; and, in reply, Councillor Mackenzie said it was proposed to supply high voltage lamps at from 6d. to 9d. each, the Corporation to bear the expense of changing them. Then a discussion arose as to the cost of electricity, in the course of which Lord Kingsburgh stated that, with the strictest economy and discipline, in his house the cost of lighting by electricity was less than by gas, taking one quarter with another. This is a remarkable experience. He did not say how much he economized down to in the matter of light. On the subject of the lamps, I am afraid that Mr. Mackenzie did not answer Lord Kingsburgh's question. The difficulty will not be with the lamps, which would require renewal very soon in any event, but with the wiring. This has been put in generally for a low voltage; and how much of it will stand the high current? That remains to be seen.

In Glasgow, the Joint Committee in charge of the electric lighting problem which has arisen, have resolved to try an experiment in Sauchiehall Street with night lamps on the bracket pattern; and they have asked the School of Art to assist them in the matter of furnishing designs for the pillars and brackets. A plan for the extension of the lighting of the streets is in preparation.

In Partick, which is an adjacent burgh to Glasgow, but quite independent of it, there is a large installation of public lighting by incandescent gas-lamps. Provost Caird, the Convener of the Watching and Lighting Committee, is highly pleased with the working of the system; and there is a probability of a further extension of it soon.

The Airdrie Iron Company have contracted to erect for the Corporation of Glasgow, at their Tradeston works, one set of condensers capable of condensing 4 million cubic feet of gas per day. This is the fifth set of similar condensers which the Company have supplied to the Corporation; the total condensing power of the whole being equal to 20 million cubic feet per day.

The recently registered Loanhead Gas Company, Mid-Lothian, have appointed as their Manager Mr. J. Tulloch, of the Wooler Gas Company.

The Larkhall Gas Company held their annual meeting on Friday of last week. It was reported that there had been an increase in the consumption of gas of more than a million cubic feet over the preceding year. A dividend at the rate of 10 per cent. per annum was declared. An extension of the mains is to be made during the summer.

A case of gas poisoning occurred in Paisley this week, in a house to which gas had only been turned on the previous day. A pipe in the back court was found to be leaking; and probably the workmen in introducing the supply had interfered with it. There were eight people in the house. The mistress awoke during the night, and found that all the other seven inmates were more or less stupified by the gas fumes. A medical man was sent for; and the sufferers soon recovered under his treatment, which was the ordinary one of fresh air, with a beverage of strong tea added. The gas was, of course, coal gas.

We hear a great deal just now about the new photography. I see someone writing to say that he has obtained a fairly good image by using an ordinary gas-burner, giving a two-hour exposure. This is interesting; but I have more remarkable information from a gentleman of a scientific cast of mind, who has been experimenting with the process. According to him, the weakness of the discovery is that it is only a sort of shadowgraph. The image is merely printed flat, without any perspective or detail, and is not photographed by the light reflected from the object. What is wanted is a lens which would concentrate, or perhaps intensify, the rays upon which the process depends. Glass is of no use for this purpose; and he turned to, of all substances in the world, cannel coal! He did so, not by accident, but from conviction; and using a slab of coal more than an inch in thickness, he obtained, he said, very good results.

CURRENT SALES OF GAS PRODUCTS.

LIVERPOOL, *Feb.* 29.

Sulphate of Ammonia.—The market has been quiet throughout the week, and prices have barely been maintained. There has been more stuff offering; but there has been no great pressure to sell. On the other hand, although dealers have not been much in evidence, they have been quietly picking up any parcels available at about recent current prices. At the close, however, the offers coming forward are at a further decline. The quotations are £8 7s. 6d. Leith and £8 8s. 9d. Liverpool and Hull. In the forward position, some makers have come out as sellers; and business is reported to have been done for several months ahead at a premium of about 5s. per ton on prompt prices.

Nitrate of Soda.—The deliveries during February have been unprecedentedly large; and notwithstanding large shipments by steamer in January and February, the market continues to harden. On spot, 8s. 3d. is now required for fine quality, and 8s. for ordinary. Due cargoes of ordinary quality are worth about 8s. per cwt.

LONDON, *Feb.* 29.

Tar Products.—The only important feature in this market is the continued firmness of carbolic acid. This product in all its firmness is in excellent demand. Very considerable shipments of it are being made; and crystals, as well as the cruder forms of acid, all show an inclination to advance in price. Benzols continue dull; but there is very little offering, as most makers have sold their production for the half year at least, as prices improved some time ago. The market shows a distinct tendency to lower values. Creosote and common tar oils keep weak; and makers are reported to have heavy stocks. There is a fairly firm market for naphthalene, in its several forms. No important sales of pitch are reported; and most makers are fully covered. But there is a little better inquiry; and it is hoped that this will not only be maintained, but, as the season advances, will be somewhat improved. Anthracene is steady; and the prices of the Committee are fully held.

The following prices represent transactions during the week: Tar, 18s. to 23s. Pitch, 33s. to 35s. 6d., according to position. Benzol, 90's, 1s. 11d.; 50's, 1s. 8d. Toluol, 1s. 6d. Solvent naphtha, 1s. 3d. to 1s. 4d. Crude, 30 per cent., naphtha, 9½d. Creosote, 1d. Naphthalene, pressed, 45s.; drained, 27s. 6d. Cresylic acid, 1s. 2d.; brown, 10d. Carbolic acid, 60's, 2s. 3d. Anthracene, "A," 11d. to 1s.; "B," 9d. to 10d.

Sulphate of Ammonia does not improve with the advance of the season, as was generally hoped. The large dealers seem to have this market entirely in their hands. The little spurt which gave encouragement and hope of better things a few weeks ago has entirely died off; and the market to-day is undoubtedly languid at prices ranging from £8 5s. to £8 8s. 9d., less 3½ per cent. in all positions, while gas liquor is offered at 6s. to 7s. per ton.

COAL TRADE REPORTS.

From Our Own Correspondents.

Lancashire Coal Trade.—In the coal trade here, a quiet tone continues to be reported generally; all descriptions of fuel being in limited demand, with a good many of the pits not kept going more than four days per week. House-fire coals have been moving off rather more readily during the last few days, owing to the more seasonable weather; but there has been no pressure of demand, and with supplies ample, prices are not more than maintained at late rates. Steam and forge qualities are in but indifferent request, and supplies continue excessive; surplus lots being offered in the open market at extremely low figures, with the result that prices are weak and irregular. At the pit mouth, best Wigan Arley remains at 10s. to 10s. 6d. per ton; Pemberton four-feet and seconds Arley, 8s. up to 9s.; common house-coal, 6s. 6d. to 7s. per ton; and ordinary steam and forge coals, not averaging more than 6s. per ton. Engine fuel meets with a fair inquiry; but supplies are more plentiful, if anything, and prices show no quotable change. Common sorts remain at 3s. to 3s. 6d. per ton; and better qualities at 4s. 6d. to 5s. For shipment, only a very small weight of business comes forward; and extremely low prices are taken to secure orders—6s. 9d. to 7s. per ton for common, to 7s. 6d. and 7s. 9d. for better sorts of steam coal, delivered at Mersey ports, being still the full average selling rates.

Northern Coal Trade.—There has been a slight increase in the demand for steam coal in the North in the last few days; but many of the collieries are still working very short time, and are likely to do so for about a month to come, after which it is hoped that there may be fuller work with the opening of navigations. For prompt delivery, best Northumbrian steam coals are quoted about 7s. 9d. per ton f.o.b.; while for delivery over the season, the price varies from 8s. 3d. to 8s. 6d. Steam smalls are rather scarcer just now, and may be generally quoted at from 3s. 7½d. to 3s. 9d. per ton. Manufacturing coals are rather steadier in demand; but the price shows no alteration, except where there is a desire for forward delivery, in which case there is a higher rate asked. There is a large demand for gas coals; but it is now falling, as is usual at this time of the year. There is a little more demand showing itself for smithy coal; but the price is unchanged. Coke is very firm; and though the production has been of late enlarged at several centres, yet it is well taken up, and the home demand seems increasing so satisfactorily that it makes up for the limited exports that take place at this season. There is an increased demand for best blast furnace coke; and the price is perhaps 3d. higher, while for forward delivery still better rates are obtainable. For shipment, the quotation is now from 14s. 6d. to 15s. 3d. per ton f.o.b.; but spread over a few months, the rate is a little higher. There is no alteration in the price of gas coke; but the output is now taken up more rapidly, partly through the reduced production.

Scotch Coal Trade.—Though there has not been any improvement in prices, the opinion is gaining ground that coal has now reached its lowest, and that any changes will be upwards. There are many inquiries for forward delivery; but coal owners are not willing to contract forward at present rates. Meantime, the volume of trade is growing; and restriction in the output is not so pronounced as it has been. Small coal is most in demand; and of the larger sorts, ell is receiving most attention. The quotations are: Main, 5s. 9d. (easy) per ton f.o.b. Glasgow; ell, 6s. 9d.; splint, 6s. 3d. to 6s. 6d.; and steam, 7s. 6d. The shipments for the week amounted to 121,291 tons—an increase on the preceding week of 14,836 tons, and on the corresponding week of last year of 26,765 tons. For the year to date, the total shipments have amounted to 883,962 tons—an increase as compared with the quantity in the same period of last year of 117,336 tons.

Lancaster Corporation Gas-Works.—At an estimated expenditure of £1300, the Lancaster Corporation Gas Committee are about to replace 70 retorts by 80 new ones. This will give them a reserve of 38 retorts.

Holophane, Limited.—Under this title, a Company has been formed with a capital of £100,000, in £1 shares, to adopt and carry into effect an agreement for the acquisition of certain patents, patent rights, &c., relating to the construction of holophane glass globes, and the benefit in any country, except the United States of America and France, of all improvements in those patents, and to carry on business as makers of, and dealers in, holophane glass globes and other globes.

Gas and Electric Lighting at St. Austell.—In the competition between the St. Austell Gas Company and the promoters of the new electric light undertaking for the lighting of the streets, to which reference was made in the "JOURNAL" for the 4th ult. (p. 240), victory rests with gas. Improvements have been made by the Company in the system of lighting; and, says a local paper, "in the opinion of the District Council gas has decidedly the better of it." This, it appears, applies both to cost and the measure of lighting power.

Sales of Shares.—Last Tuesday, Messrs. W. Bush and Son disposed of some stock and shares in the Sheffield United Gaslight Company at higher prices than had been obtained on previous occasions. £200 "B" Stock went at 242½ per cent.; £181 "C" Stock, at 240 per cent.; eleven "D" shares, at £10 10s. each; and thirteen "F" shares, at £3 17s. 6d. each.——Last Tuesday, £100 of 10 per cent. consolidated stock of the Derby Gas Company realized £255. Ten shares of £10 each in the Olney Gas Company fetched £118 2s. 6d., or an average of £13 2s. 6d. each.——Very keen interest was evinced in the biddings for 20 original shares (£20) in the Ventnor Gas and Water Company, which were put up by Mr. E. Wetherick a few days ago. The Directors have lately declared a dividend of 3½ per cent. for the past half year; and this fact doubtless stimulated competition for the shares. They were put up at £25, and finally disposed of at £31 each.

GAS AND WATER COMPANIES' STOCK AND SHARE LIST (see ante, p. 452).

Issue.	Share.	When ex. Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p. c.	GAS COMPANIES.			£ s. d.
590,000	10	16 Oct.	10½	Alliance & Dublin 10 p. c.	23½—24½	..	4 5 8
100,000	10	"	7½	Do. 7 p. c.	16½—17½	..	4 5 8
300,000	100	2 Jan.	5	Australian (Sydney) 5 % Deb.	108—110	+1	4 10 11
200,000	10	16 Oct.	4	Belgrano (B. Ayres), Limited	7⅛—8½	..	4 14 1
100,000	Stck.	30 Dec.	5	Do. 5 p. c. Deb. Stk	95—100	+3	5 0 0
200,000	5	14 Nov.	6½	Bombay, Limited	7½—7⅝	..	4 3 10
40,000	5	"	6½	Do. New, £4 paid	5½—5⅝	+⅛	4 10 3
380,000	Stck.	27 Feb.	12	Brentford Consolidated	275—280*	+3	4 5 8
210,000	"	"	9	Do. New	213—218*	+2½	4 2 6
50,000	"	"	5	Do. 5 p. c. Pref.	—	..	—
159,375	"	16 Dec.	4	Do. 4 p. c. Deb. Stock.	127—132	..	3 0 7
220,000	Stck.	27 Sept.	11	Brighton & Hove Original	230—235	..	4 13 8
208,820	"	"	8	Do. A Ord. Stk.	185—190	..	4 4 3
933,500	Stck.	27 Feb.	5	Bristol, 5 p.c. max.	123—126*	+1	3 19 4
420,000	20	27 Sept.	11½	British	55—56	+½	4 0 4
50,000	10	29 Aug.	11½	Bromley, Ordinary 10 p. c.	22½—23½	..	4 17 10
71,000	10	"	8½	Do. 7 p. c.	19—20	..	4 5 0
500,000	10	14 Nov.	4	Buenos Ayres (New) Limited	9½—10	+¼	4 0 0
200,000	100	2 Jan.	6	Do. 6 p. c. Deb.	102—104	+1	5 15 5
150,000	20	27 Feb.	8½	Cagliari, Limited	29—31*	..	5 6 5
100,000	10	27 Sept.	6	Cape Town & District, Ltd.	12½—13½	..	4 8 10
50,000	50	2 Nov.	6	Do. 6 p. c. 1st Mort.	56—58	..	5 3 6
550,000	Stck.	16 Oct.	13½	Commercial Old Stock	328—333	..	4 1 1
165,000	"	"	10½	Do. New do.	257—262	..	4 0 3
165,000	"	16 Dec.	4½	Do. 4½ p. c. Deb. do.	147—152	..	2 19 2
800,000	Stck.	16 Dec.	13	Continental Union, Limited.	277—282	+7	4 12 2
200,000	"	"	10	Do. 7 p. c. Pref.	215—220	..	4 10 11
51,600	Stck.	27 Feb.	14	Croydon Com'cial A 10 p. c.	280—285*	+7	4 18 3
157,500	"	"	11	Do. B 7 p. c.	222—226*	+5	4 17 4
535,000	Stck.	27 Feb.	5½	Crystal Palace Ord. 5 p.c. Stk	130—135*	+2½	3 17 9
60,900	"	"	5	Do. 5 p. c. Pref.	—	..	—
486,090	10	30 Jan.	11	European, Limited	26½—27½	+⅛	4 0 0
354,060	10	"	11	Do. £7 10s. paid	17½—18½	+⅛	4 9 3
5,746,590	Stck.	13 Feb.	12¾	Gaslight & Coke, A, Ordinary	305—310	..	4 2 3
100,000	"	"	4	Do. B, 4 p. c. max.	105—110	..	3 12 9
665,000	"	"	10	Do. C, D, & E, 10 p.c. Pf.	288—293	..	3 8 3
30,000	"	"	5	Do. F, 5 p. c. Prf.	135—140	..	3 11 5
60,000	"	"	7⅛	Do. G, 7⅛ p. c. do.	200—205	..	3 13 2
1,300,000	"	"	7	Do. H, 7 p. c. max.	197—202	..	3 9 3
463,000	"	"	10	Do. J, 10 p. c. Prf.	285—290	..	3 9 0
476,000	"	"	6	Do. K, 6 p. c. Prf.	168—172	..	3 9 8
1,061,150	"	16 Dec.	4	Do. 4 p. c. Deb. Stk.	137—140	..	2 17 2
294,850	"	"	4½	Do. 4½ p. c. do.	148—153	..	2 18 9
908,000	"	"	6	Do. 6 p. c. do.	204—209	..	2 17 5
70,000	10	30 Oct.	6	Hongkong & China, Limited	13—14	..	4 5 8
3,800,000	Stck.	14 Nov.	12	Imperial Continental	252—257	+2	4 13 4
376,400	100	1 Feb.	4	Do. 4 p. c. Debs. Red.	100—103	..	3 17 8
473,600	Stck.	13 Feb.	3½	Do. 3½ p. c. Deb. Stk	108—110	..	3 3 8
75,000	5	16 Dec.	6	Malta & Mediterranean, Ltd.	6—6½	..	4 12 4
560,000	100	1 Oct.	5	Met. of Melbourne, 5 p. c. Deb.	115—118	..	4 4 10
250,000	100	"	4½	Do. 4½ p. c. Debs.	109—111	+1	4 1 1
541,920	20	14 Nov.	5	Monte Video, Limited	16—17	..	5 17 8
150,000	5	28 Nov.	8	Oriental, Limited	8¼—8¾	..	4 11 5
135,000	5	"	8	Do. New, £4 10s. paid	6¾—7½	..	4 19 4
15,000	5	"	8	Do. do. 1879, £1 paid	1⅝—2	..	4 0 0
60,000	5	12 Sept.	7	Ottoman, Limited	5—5½	..	6 7 3
166,870	10	14 Feb.	2	Para, Limited	1¼—1⅝	..	11 8 6
420,000	100	2 Nov.	6	People's Gas } 1st Mtg. Bds.	105—110	..	5 9 1
500,000	100	9 Dec.	6	of Chicago } 2nd Do.	100—105	..	5 14 3
250,000	10	16 Oct.	7	San Paulo, Limited	11½—12½	..	5 12 0
500,000	Stck.	13 Feb.	15½	South Metropolitan, A Stock	382—387	+7	4 0 1
1,350,000	"	"	12	Do. B do.	308—313	+3	3 16 8
310,000	"	"	13	Do. C do.	325—330	+4	3 18 9
800,000	"	16 Jan.	5	Do. 5 p. c. Deb. Stk.	175—178	+2	2 16 2
60,000	Stck.	12 Sept.	11½	Tottenham & Edmonton, A	250—255	..	4 10 2
60,200	"	"	8½	Do. B	—	..	—
170,380	10	30 Dec.	10	Tuscan, Limited	13—14	..	7 2 10
149,900	10	2 Jan.	5	Do. 5 p. c. Debs. Red.	100—102	..	4 18 0

WATER COMPANIES.

746,021	Stck.	30 Dec.	10½	Chelsea, Ordinary	312—317	..	3 4 8
150,000	"	"	5	Do. 5 p. c. Pref.	168—173	..	2 17 9
160,000	"	"	4½	Do. 4½ p. c. Pref. Stk., 1875	—	..	—
175,785	"	27 Sept.	4½	Do. 4½ p. c. Deb. Stock	155—160	..	2 16 3
1,719,514	Stck.	16 Oct.	7	East London, Ordinary	250—255	+2	2 14 10
654,740	"	30 Dec.	4½	Do. 4½ p. c. Deb. Stk.	155—160	..	2 16 3
100,000	"	"	3	Do. 3 p. c. Deb. Stk.	105—107	..	2 16 1
700,000	50	16 Dec.	6½	Grand Junction, 10 p.c. max.	124—128	..	2 10 9
280,000	Stck.	27 Sept.	4	Do. 4 p. c. Deb. Stk.	145—150	..	2 13 4
708,000	Stck.	13 Feb.	12	Kent	327—332	+2	3 12 3
160,000	"	"	7	Do. New, 7 p. c. max.	205—210	..	3 6 8
1,043,800	100	30 Dec.	7½	Lambeth, 10 p. c. max.	260—265	+3	2 14 8
406,200	100	"	7½	Do. 7½ p. c. max.	212—217	..	3 6 11
330,000	Stck.	27 Sept.	4	Do. 4 p. c. Deb. Stk.	147—152	+2	2 12 8
500,000	100	13 Feb.	12¾	New River, New Shares	410—415	..	3 1 5
1,000,000	Stck.	30 Jan.	4	Do. 4 p. c. Deb. Stk.	147—152	..	2 12 8
902,300	Stck.	16 Dec.	6	S'thwk & V'xhall, Ordinary	168—173	+6½	3 9 5
126,500	100	"	6	Do. Do. 7½ p. c. Max.	150—160	+7½	3 15 0
489,200	Stck.	"	5	Do. Do. 5 p. c. Pref.	168—173	..	2 17 9
1,019,585	"	—	4	Do. 4 p. c. A Deb. Stk.	147—152	..	2 12 8
1,155,066	Stck.	16 Dec.	10	West Middlesex	305—310	..	3 4 6
200,000	"	"	4½	Do. 4½ p. c. Deb. Stk.	155—160	..	2 16 3

*Ex div.

The Water Distribution System at Reading.—The Manager of the Reading Corporation Water-Works (Mr. A. T. Walker) has recently prepared a special report for the consideration of his Committee and the Council upon the general state of the water distribution system. He recommends extensive alterations and improvements, the execution of which will, he calculates, cost £8645.

Reductions in Price.—The Directors of the Longwood Gas Company have decided to reduce the price of gas 3d. per 1000 cubic feet from the 1st of July next. The Directors of the Thirsk Gas Company have notified their intention of reducing the price of gas from 4s. to 3s. 9d. per 1000 cubic feet from the same date. The North Middlesex Gas Company will reduce their price from 4s. 3d. to 4s. per 1000 cubic feet next month.

Cologne Gas Supply.—The report on the working of the municipal gas-works of Cologne, which has lately been issued, shows a consumption for the year 1894-1895 of 840,660,000 cubic feet of gas—an increase of 2·3 per cent. on that of the preceeding year. There is, however, a decrease of 4·03 per cent. in the gas used for lighting purposes; but the enormous increase of 39·07 per cent. in that employed for cooking and heating and for gas motors. The gas delivered contained, on an average, 1·72 per cent. by volume of carbonic acid, and 16·8 grains of sulphur, per 100 cubic feet. Its average illuminating power, with an argand burner, calculated to English standard terms, was 14·08 candles.

More Divining for Water.—Mr. J. Stears, of Hull, a well-known user of the divining-rod to find water, recently visited Bolton, with the object of assisting the Bolton Co-operative Society, Limited, who are adding a refrigerator to their premises. Mr. Stears was successful in indicating the course of an underground stream. Mr. Mullins, another "diviner," recently had his powers tested at Beauchamp Roding, in Essex; and he pointed out a spot where water had actually been found a few hours before his arrival—of which fact he was, of course, unaware. The water-works which are to be constructed on the Laindon Estate are to utilize water of which the existence was vouched for by Mr. Mullins.

The Malvern Gas and Water Works Extensions.—At a meeting of the Gas and Water Committee of the Malvern District Council held last Tuesday, it was resolved, on the recommendation of the Engineer and Manager (Mr. H. P. Maybury) to lay an additional 10-inch water-main from the Camp reservoir to the town—a distance of 7456 yards, the estimated cost of the works being £4000. This outlay, together with the gas and water extensions mentioned in the "JOURNAL" for the 18th ult., is rendered necessary by the extension of the district. On Friday last, two Inspectors of the Local Government Board (Colonel Marsh, R.E., and Mr. T. Thompson) held an inquiry at the Imperial Hotel, Malvern, relative to an appeal which had been lodged against the inclusion of the rural district of Malvern Wells, in the urban district of Great Malvern. As nine-tenths of the inhabitants of the Wells are in favour of amalgamation, it is generally believed that an Order will be made accordingly.

Tottenham and Edmonton Gas Company.—The half-yearly meeting of this Company was held last Saturday, when the Chairman (Mr. George Gupper) had the pleasure of submitting a report which showed that there had been an increase in the quantity of gas sold, compared with the corresponding period of 1894, of 24,033,000 cubic feet, which was equal to 13·10 per cent. The total number of meters in use on Dec. 31 last was 8305, of which 5647 were ordinary, and 2658 automatic meters—the increase since June 30 having been respectively 158 and 833. The number of cooking-stoves fixed on rental on Dec. 31 was 1071; being an increase of 203 since midsummer. After transferring £500 to the insurance fund and £400 to the reserve fund, there was an available balance of £9645, including £1833 brought forward, from which the Directors recommended the declaration of dividends at the rate of 11½ per cent. per annum on the "A" stock and of 8½ per cent. on the "B" and "C" stocks. The income for the half year was £36,179; and the expenditure £26,599—giving a profit on the working of £9580. The coal carbonized amounted to 11,671 tons; 290,092 gallons of petroleum were used for enrichment; and 1496 tons of coke were required for the manufacture of water gas. The quantity of gas produced was not stated; but 207,486,500 cubic feet were sold. The estimate of the residual products made, under the supervision of the Engineer and Manager (Mr. W. H. H. Broadberry), was: Coke, 6961 tons; breeze, 1265 chaldrons; tar, 116,710 gallons; ammoniacal liquor, 3242 butts; and sulphate of ammonia, 97 tons.

The West Riding Rivers Board and the Sheffield Corporation Water Bill.—At the last meeting of the West Riding Rivers Board, the Finance and Parliamentary Committee reported that they had had the Sheffield Corporation Water Bill under consideration. The part of the Bill more particularly affecting the interests of the Board was that relative to the quantity of the compensation water and the method of its discharge. The quantity proposed to be discharged, when all three reservoirs were constructed, was 4,712,631 gallons. Whether this was sufficient in relation to the yield of the gathering-ground, was a question requiring much careful consideration and calculation. With respect to the method of discharge, the Bill did not observe the views previously adopted by the Board, and concerning which the Board were at present opposing the Barnsley Corporation Bill. The effect of these proposals was that, in the first instance, the compensation water would only be discharged for twelve hours a day; but none would be discharged on Sunday, Christmas Day, and Good Friday. Power was conferred on one interest only in the river—viz., the millowners (in utter disregard of sanitary, riparian, and agricultural interests), to alter these hours, and control the discharge as they thought fit. The proposals were considered to be contrary to the spirit of the Standing Orders of Parliament and to the true interests of the rivers, which required that the flow of compensation water should be continuous. It was therefore recommended that, unless clauses in protection of the interests of the Rivers Board and the inhabitants of the Riding were inserted, the Bill should be opposed. The minutes were adopted.

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401	18½	13½	11½	14	11	9½	13½ by 11½	1	28/6	—
402	24½	15½	15	18	11	11	15½ ,, 15	2	40/-	2/6
403	30	18	17	19	11	11	18 ,, 17	2	45/-	2/6
404	30	18	17	19	13½	11	18 ,, 17	2	50/-	2/6
404	If fitted with Enamelled-Lined and Jacketted Door and Fire-Brick Crown, as adopted by The London Gaslight and Coke Co.								55/-	2/6

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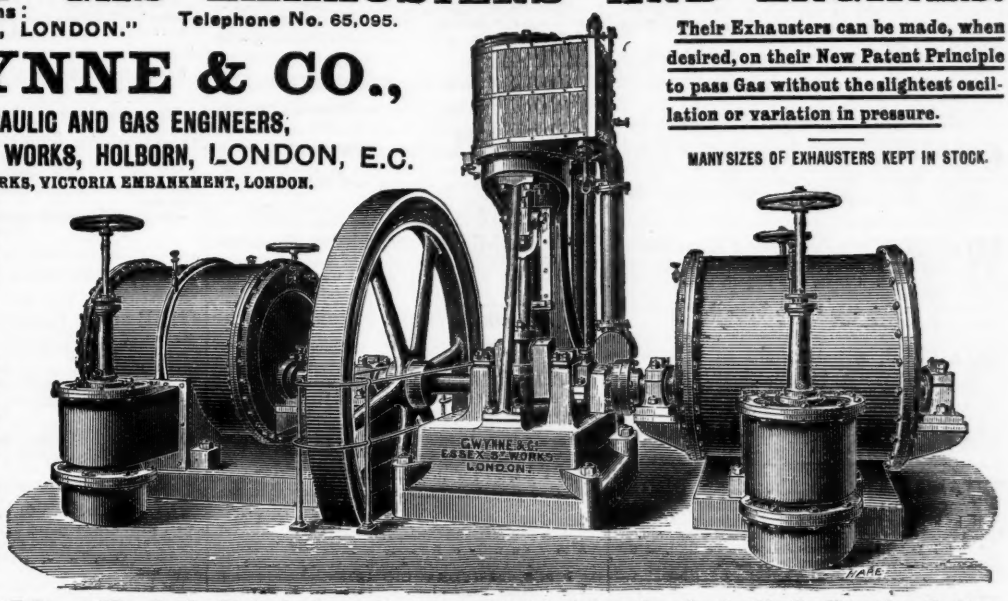

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For further Particulars, apply to G. E. SAVILLE, Engineer, Gas-Works, TODMORDEN.

WIDNES CORPORATION GAS AND WATER WORKS.

GAS PLANT, &c., FOR SALE.

THE Gas and Water Committee have the following PLANT for disposal: ANNULAR CONDENSER, 12-inch STATION GOVERNOR, ENGINE and EXHAUSTER (capacity, 22,000 Cubic Feet per hour), MANN and WALKER TOWER SCRUBBER 38 ft. by 8 ft., and a WALKER PURIFYING-MACHINE of 1 Million Cubic Feet capacity per diem.
Further Particulars may be obtained on application to Mr. ISAAC CARR, Assoc.M.Inst.C.E., Gas-Works, WIDNES.

MILLOM URBAN DISTRICT COUNCIL.
(GAS DEPARTMENT.

THE Gas Committee invite Tenders for the EXTENSION of RETORT-HOUSE and RETORTS; also TENDERS for EXHAUSTER, STATION METER, GOVERNOR, MAINS, &c., at the Millom Gas-Works.
Plans and Specifications may be seen at my Office on and after the 28th of February inst.
Sealed tenders, endorsed "Extensions to Retort-House, &c.," or "Tender for Exhauster, &c.," must be sent in to me on or before the 14th of March prox.
The Council will not be bound to accept the lowest or any tender.
W. T. LAWRENCE,
Clerk to the Council.
Millom, Cumberland,
Feb. 24, 1896.

URBAN DISTRICT COUNCIL OF DUKINFIELD.

TENDERS FOR GAS COAL.

THE Gas Committee require Tenders for Seven Thousand Five Hundred Tons of GAS COAL, to be delivered by Road, Rail, or Canal, commencing on the 1st of May next, and concluding the 30th of June, 1897. Of this quantity, 3500 Tons will be received before the 15th of August next for Stock. None but fresh-got screened best quality GAS COAL free from fault need be offered; and no Testimonials or Analyses are required.
No Tender will be considered which may be received after Twelve at noon on Wednesday, the 25th of March.
Sealed envelopes, endorsed "Coal," to be directed to the Chairman of the Committee, Mr. Councillor Halstead, Gas Offices, Charles Street, Dukinfield.
Tender Forms and further Particulars on application to
HARRISON VEEVERS, C.E.,
Engineer and Secretary.
Dukinfield, Feb. 27, 1896.

BANDON TOWN COMMISSIONERS (Co. CORK).

TENDERS FOR GAS COAL.

TENDERS are invited for the supply of 400 Tons of best double-screened GAS COAL, for immediate Shipment, to be delivered free of all charges, viz.—
Albert Quay, Cork, at per ton; or
Kilmacsimon Quay, Cork, at per ton.
Contractor to state in Tender the Pit from which he proposes to supply the Coal, and to produce Bill of Lading and Colliery Certificate previous to commencement of delivery.
Tenders, sealed and endorsed "Tenders for Gas Coal," to be sent to the undersigned not later than the 6th of March, 1896, at Ten o'clock a.m.
The Commissioners do not bind themselves to accept the lowest or any tender.
By order,
JOHN M'DONNELL,
Town Clerk.
Board-Room, Bandon,
Feb. 22, 1896.

CORPORATION OF LIMERICK.

THE Gas Committee are prepared to receive TENDERS for the supply and erection of two 20 feet square PURIFIERS, with Planed Joints, Connections, Lifting Gear, &c.
Particulars may be obtained on application to
P. J. BAKER,
Engineer.
Gas-Works, Limerick,
Feb. 26, 1896.

SKELMERSDALE URBAN DISTRICT COUNCIL

THE above Council invite Tenders for the supplying and fixing of four PURIFIER LIDS and LUTES complete, particulars of which may be seen at the Offices any day between Nine and Ten a.m.
Tenders to be sent in on or before March 7 next.
WILLIAM CORNS,
Engineer and Surveyor.

THE URBAN DISTRICT COUNCIL OF PADIHAM.
(GAS DEPARTMENT.)

THE Gas Committee of the above Council are prepared to receive TENDERS for the purchase of the surplus TAR and AMMONIACAL LIQUOR to be produced at their Gas-Works, for One Year, commencing April 1, 1896.
For Particulars, apply to
J. R. SMITH,
Clerk to the Council.
District Council Offices, Padiham,
Feb. 26, 1896.

TENDERS FOR GAS COAL, ETC.

THE Directors of the Preston Gas Com- pany are prepared to receive TENDERS for the supply of CANNEL and screened and unscreened GAS COAL for One, Three, or Five Years, from the 30th of June next.
Particulars may be obtained from the undersigned.
Tenders, stating class of Coal, District and Pit where raised, and Price, addressed to the Chairman of the Company, and endorsed "Tender for Coal, &c.," must be delivered on or before Wednesday, the 4th of March, 1896.
HENRY GREEN,
Secretary.

TENDERS FOR GAS COAL.

THE Corporation Gas Committee of Stoke-upon-Trent invite TENDERS for the supply of GAS COAL.
Specification and Form of Tender may be obtained on application to the undersigned, or at the Gas Offices.
Tenders to be sent in not later than Twelve o'clock noon, the 12th of March, 1896, addressed to Councillor F. Geen, Chairman, Gas Committee, Stoke-upon-Trent, and endorsed "Tender for Gas Coal."
WM. PRINCE,
Engineer and Manager.
Gas-Works, Stoke-upon-Trent.

PERTH CORPORATION.

TENDERS FOR GASHOLDER.

THE Perth Gas Commissioners invite TENDERS for the supply and erection of a TELESCOPIC GASHOLDER, with Cast-Iron Tank, 125 feet in diameter.
Copies of Plans and Specification may be had on application to the Commissioners' Engineer, Mr. Andrew Wilson.
Offers to be lodged with William MacLeish, Esq., Clerk to the Commissioners, City Chambers, Perth, not later than Saturday, the 14th of March.
The Commissioners do not bind themselves to accept the lowest or any offer.
Gas-Works, Perth,
Feb. 25, 1896.

CLAYTON, ALLERTON, AND THORNTON GAS COMPANY.

WANTED, Tenders for the supply and erection of a TELESCOPIC GASHOLDER, 60 feet diameter, at the Wilsden Station of the above Company.
Drawings and Specification to be seen at the Company's Office, Clayton.
Tenders to be sent in on or before the 9th day of March, 1896.
By order,
JOHN NIVEN,
Secretary and Engineer.
Gas Office: Clayton, near Bradford,
Feb. 18, 1896.

EDINBURGH AND LEITH CORPORATIONS GAS COMMISSIONERS.

THE Gas Commissioners are prepared to receive OFFERS for the supply and delivery of CAST-IRON Spigot and Faucet MAIN PIPES, 24 inches, 18 inches, 12 inches, and 8 inches diameters respectively. These Pipes will be delivered at various stations throughout the City, to suit the requirements of the Work.
Specifications and all Particulars may be obtained from Mr. Robert Mitchell, Engineer and Manager, New Street Gas-Works, Edinburgh.
Tenders to be lodged with the undersigned on or before Monday, the 9th day of March, 1896, at Ten a.m., endorsed "Tender for Main Pipes."
The Commissioners do not bind themselves to accept the lowest or any offer, and reserve to themselves the right of accepting the whole or any portion of the material tendered for.
JAMES M'G. JACK,
Clerk.
25, Waterloo Place, Edinburgh,
Feb. 25, 1896.

ISSUE OF STOCKS AND SHARES BY AUCTION UNDER PARLIAMENTARY POWERS.

MR. ALFRED RICHARDS undertakes the issuing by Auction of GAS AND WATER SHARES under Parliamentary Powers.

He also holds MONTHLY SALES of GAS AND WATER SHARES at the Auction Mart, Tokenhouse Yard, E.C.

Terms for the issuing of Capital, and also for offering to auction Gas and Water Shares, and all Particulars relating thereto, may be had of Mr. Alfred Richards.

Offices: 18, FINSBURY CIRCUS, E.C.

Second Portion of the Estate of the late William Halfhead, Esq.—Important Sale of Gas and Water Stocks and Shares.

Gaslight and Coke Company—£450 Stock ("A" and "K").
Commercial Gas Company—£520 Stock (Old and New, and Debenture).
Hornsey Gas Company—£1220 Stock ("C," "B," and Preference).
West Ham Gas Company—287 Shares and £700 Debenture Stock.
Tottenham and Edmonton Gas Company—£460 Stock ("A" and "B").
Lea Bridge Gas Company—15 Shares (Original).
Romford Gas Company—47 Shares (Original and "B").
West Kent Gas Company—44 Shares (Original and New).
Worthing Gas Company—£200 Stock and 10 New Shares.
Enfield Gas Company—£731 Stock (Preference and Debenture).
North Camp and Farnborough Gas Company—20 Shares.
Bournemouth Gas and Water Company—40 "B" Shares, £300 Debenture Bonds.
Barnet District Gas and Water Company—£150 Stock, 20 "D" Shares.
West Surrey Water Company—152 Ordinary and Preference Shares and £450 Debenture Stock.

All paying good Dividends and offering Investments of the highest character.

MR. ALFRED RICHARDS will Sell the above BY AUCTION, at the Mart, E.C., on Wednesday, March 18, at Two o'clock precisely, in lots.

Particulars of MESSRS. LEWIS AND SONS, Solicitors, 7, WILMINGTON SQUARE, W.C., and of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C., and TOTTENHAM.

BY ORDER OF THE DIRECTORS OF THE CROYDON COMMERCIAL GAS AND COKE CO.

ISSUE OF £5900 NEW CONSOLIDATED "B" STOCK.

HOOKER & WEBB will Sell by Auction, at the Greyhound Hotel, Croydon, on Thursday, the 12th of March, 1896, at Six o'clock precisely, in 76 Lots, £5900 CONSOLIDATED "B" STOCK of the Croydon Commercial Gas and Coke Company.

The Dividend paid on the "B" stock for some years has been at the rate of 11 per cent. per annum; and it is capable of further increase. The Sale therefore offers an unusually good opportunity for Safe Investment.

Particulars and Conditions of Sale can be obtained of Mr. W. J. RUSSELL, the Secretary, at the Offices of the Company, Katharine Street, Croydon; Messrs. BLYTH, DUTTON, HARTLEY, and BLYTH, Solicitors, 112, Gresham House, LONDON, E.C.; at the Place of Sale; and of the AUCTIONEERS, 4, High Street, CROYDON.

COLNE VALLEY WATER COMPANY.

SALE BY TENDER OF ONE THOUSAND NEW ORDINARY SHARES OF £10 EACH.
MINIMUM PRICE, £13 PER SHARE.

NOTICE is Hereby Given, that it is the intention of the Directors of the above Company to SELL BY TENDER One Thousand New ORDINARY SHARES of £10 each.

Particulars, with Forms of Tender, can be obtained on application at the Company's Office; and Tenders must be sent in on or before the 18th of March, 1896.

By order,
WM. VERINI, Secretary.

Office: Bushey, Watford,
March 2, 1896.

NEWBATTLE CANNEL.

Highest Results in Gas, & Excellent Coke.

QUOTATIONS ON APPLICATION TO

THE LOTHIAN COAL COMPANY,

LIMITED,

NEWBATTLE COLLIERIES,

DALKEITH, N.B.

JAMES OAKES & Co.,

ALFRETON IRON-WORKS, DERBYSHIRE,

AND

Wenlock Iron Wharf, 21 & 22, Wharf Road, CITY ROAD, LONDON, N.,

Manufacture and keep in Stock at their Works (also large stock in London)

PIPES and CONNECTIONS, 1½ to 48 inches in diameter, and make and erect to order RETORTS, PURIFIERS and TANKS, with or without planed joints, COLUMNS, GIRDERS, SPECIAL CASTINGS, &c., required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.

NOTE.—Makers of HORSLEY'S PATENT SYPHONS. These are cast in one piece, without Chaplets; doing away with bolts, nuts and covers, and rendering leakage impossible.

NOTICE.

Whereas it has come to the knowledge of the INCANDESCENT GAS-LIGHT COMPANY, Limited, of Palmer Street, Westminster, that a Company called the Meteor Incandescent Gas-Light Company, Limited, a firm known as Putz and Co., and a Company known as the Evening Sunlight Incandescent Light Company or the New Incandescent Light Company, are selling, and are offering for sale, forms of Incandescent Gas-Lights called respectively the "Meteor," the "Champion," and the "Evening Sunlight,"

THIS IS TO GIVE NOTICE, THAT THE INCANDESCENT GAS-LIGHT COMPANY, LIMITED, will commence ACTIONS FOR INFRINGEMENTS OF THEIR PATENTS against all persons found dealing in any manner with the said "Meteor," "Champion," or "Evening Sunlight" Incandescent Gas-Lights, which are all constructed in Infringement of the Patent of the Incandescent Gas-Light Company, Limited.

The validity of the Company's Patent has been certified by the Hon. Mr. Justice Romer.

FAITHFULL & OWEN,
11, Victoria Street, S.W.
Solicitors for the Incandescent Gas-Light Company, Limited.

NOTICE.

THE INCANDESCENT GAS-LIGHT COMPANY, LIMITED, Hereby Give Notice, that they only supply their Mantles subject to the following express Conditions, which are printed and pasted on each box:—

"The Incandescent Gas-Light Company, Limited, in supplying the Mantle contained in this box, grant a Limited License to the purchaser to sell or use the same on the express condition that neither the purchaser nor any other person into whose hands the same may come shall use or sell the said Mantle except in connection, or for use, with Burners sold or supplied by the Company; any other sale or use will amount to Infringement of the Company's Patents. The Company supply Mantles for the purpose of renewals at the nominal price of 1s. 3d., subject to the Conditions and Limitations above set forth."

In the case of *The Incandescent Gas-Light Company, Limited v. Cantelo*, Mr. Justice Wills upheld the Validity of these Conditions and Limited License; and, in the course of his Judgment, said:—

> The patentee has the sole right of using and selling the articles; and he may prevent anybody from dealing with them at all. Inasmuch as he has the right to prevent people from using them or dealing in them at all, he has the right to do the lesser thing—that is to say, to impose his own conditions. It does not matter how unreasonable or how absurd the conditions are. It does not matter what they are if he says at the time when the purchaser proposes to buy, or the person proposes to take a license: 'Mind I only give you this license on this condition;' and the purchaser is free to leave it or take it as he likes. If he takes it, he must be bound by the condition."

In the case of *The Incandescent Gas-Light Company v. Hirschfeld and Others*, the Honourable Mr. Justice Romer certified that the Validity of the Plaintiffs' Patents was established. Infringers in future will be liable to costs as between Solicitor and Client.

(Signed) FAITHFULL & OWEN,
Solicitors for the Incandescent Gas Light Company, Limited.

THE INCANDESCENT GAS-LIGHT COMPANY, LIMITED.

WARNING.

THE INCANDESCENT GAS-LIGHT COMPANY, LIMITED.

WHEREAS, it has been brought to the notice of the INCANDESCENT GAS-LIGHT COMPANY, LIMITED, THAT DIVERS FIRMS UPON THE CONTINENT OF EUROPE are Manufacturing Incandescent Gas-Mantles, and are sending the same into this Country, and are advertising for Agents to push the sale of these Mantles,

THIS IS TO GIVE NOTICE, THAT ALL SUCH MANTLES ARE INFRINGEMENTS OF THE COMPANY'S PATENT, and that the Company will take proceedings for Infringement against all persons purchasing or using any of such Incandescent Gas-Mantles. THE COMPANY OWN THE MASTER PATENTS in this Country for the manufacture of Incandescent Gas-Mantles, and the validity of such Patents has already been certified by the Honourable Mr. Justice Romer, and the Company will enforce their Patent Rights against all Infringers.

FAITHFULL & OWEN,
Solicitors for the Incandescent Gas-Light Company, Limited.
11, Victoria Street, Westminster.

NOTICE.

The attention of the METEOR INCANDESCENT LIGHTING COMPANY, LIMITED, having been again called to the Advertisements inserted in various papers by the Incandescent Gas-Light Company, Limited, of Palmer Street, Westminster, to the effect that the "Meteor" Incandescent Gas-Lights are an Infringement of their Patents, and that they will bring Actions for Infringement against all persons found dealing in any manner with such Lights, the METEOR INCANDESCENT LIGHTING COMPANY, LIMITED, HEREBY GIVE NOTICE that they are advised that the "Meteor" Incandescent Lights in no way infringe any of the Patents of the Incandescent Gas-Light Company, Limited, that an Action has been commenced to restrain such threats, and that they are PREPARED TO FULLY INDEMNIFY ALL PURCHASERS, DEALERS, AGENTS, and USERS of their Lights against any Legal Proceedings on the part of the Incandescent Gas-Light Company, Limited.

WILSON, BRISTOWS, & CARPMAEL,
1, Copthall Buildings, London, E.C.,
Solicitors to the Meteor Incandescent Lighting Company, Limited, of 35, New Broad Street, London, E.C.

Nov. 30, 1895.

LOW MOOR BLACK BED

GAS COAL.

YIELD OF GAS PER TON - 10,375 CUBIC FEET.
ILLUMINATING POWER - 17·50 SPERM CANDLES.
COKE - - - - - - - - 75 PER CENT.

Prices, f.o.r. or f.o.b., on application to

GEORGE & JOHN HAIGH,
RAVENS LODGE AND CONYERS' COLLIERIES,
DEWSBURY.

A TRIAL IS RESPECTFULLY SOLICITED.

TAR AND LIQUOR PURCHASED.

JOHN CLARKSON MAJOR,

(Established 1851,)

Tar Distiller and Manufacturing Chemist,

WOLVERHAMPTON.

HOLMSIDE GAS COALS.

PRESENT DAILY PRODUCE OVER 4000 TONS.

LATEST ANALYSIS—By CHARLES PHILLIPS, Gas Examiner to Rotherham Corporation.

Yield of Gas Per Ton . . 11,205 Cubic Feet.
Illuminating Power, 16 7/10 Stand. Sperm. Candl.
Coke (of good & pure quality) 13¾ Cwt. Per Ton.
Sulphur . . . . A little over 1 Per Cent.
Ash . . . . . Under 1 Per Cent.
Tar . . . . . 163 Lbs. (Avoir.) Per Ton.
Ammoniacal Liquor 103 Lbs. (Avoir.) Per Ton.

HOLMSIDE GAS COALS are supplied to the largest Gas Companies in England and on the European Continent; London alone consuming about half the produce.

SOUTH MOOR PELTON GAS COALS.

PRESENT DAILY PRODUCE AVAILABLE 2500 TONS.

RESULTS OF DIFFERENT ANALYSES:—

Yield of Gas Per Ton . . 10,500 Cubic Feet.
Illuminating Power . 17 Stand. Sperm Candl.
Coke (of excellent quality) . 13½ Cwt. Per Ton.
Sulphur . . . . . 1·13 Per Cent.
Ash. . . . . 1·34 Per Cent.
Tar. . . . . 180 Lbs. (Avoir.) Per Ton.
Ammoniacal Liquor 94½ Lbs. (Avoir.) Per Ton.

The HOLMSIDE and SOUTH MOOR COAL-FIELD possesses *a very great quantity of the best Coal;* and, whilst other Coal-Fields are becoming exhausted, this one is only being opened out, so that *the quality* of both the HOLMSIDE COALS, and the SOUTH MOOR COALS *may be relied upon for all practical purposes.*

These Coals may be bought through the Principal Merchants in England, or direct from

MR. MARK ARCHER,

HOLMSIDE AND SOUTH MOOR OFFICES,

NEWCASTLE-UPON-TYNE.

BOLDON GAS COALS.

Worked by THE HARTON COAL CO., LTD.

Output about 3000 tons per day.

ANALYSIS—

Yield of Gas per ton . .	10,500	Cubic Feet.
Illuminating Power . .	16·9	Candles.
Coke	66·7	Coke.
Sulphur	0·86	Sulphur.
Ash	2·04	Ash.

Boldon Gas Coals are supplied under contract to

The Gaslight and Coke Company, South Metropolitan Gas Company, Commercial Gas Company, Imperial Continental Gas Association, European Gas Company, L'Union des Gaz (the Continental Union Gas Company), Crystal Palace District Gas Company, Danish Gas Company, Bombay Gas Company, San Paulo Gas Company, Alliance and Dublin Consumers' Gas Company, Ipswich Gaslight Company, Newcastle Gas Company, Sunderland Gas Company, South Shields Gas Company, and to many other Companies at Home and Abroad.

For prices, &c., apply to the

HARTON COAL COMPANY,

LIMITED,

Newcastle-on-Tyne.

W. H. PARKINSON,

FITTER.

HEBBURN MAIN GAS COALS.

Yield of Gas per ton . . . . . 10,500 cub. ft.
Illuminating Power . . . . . 16·4 candles.
Coke . . . . . 68 per cent.

For prices, f.o.b. Ship or Delivered by Rail, apply to

THE WALLSEND & HEBBURN COAL COMPANY, LTD.,

8 Lombard Street,

NEWCASTLE-ON-TYNE.

W. RICHARDSON, Fitter.

THORNLEY GAS COALS

WORKED BY THE

WEARDALE IRON & COAL Co., LD.

OUT OF THEIR

THORNLEY AND WHEATLEY HILL COLLIERIES.

Analysis made by

Messrs. J. & H. S. PATTINSON, *May 28, 1895.*

Yield of Gas per Ton . . 10,500 Cub. Ft.
Illuminating Power . . 16·9 Candles.
Coke (of good quality) . . 67·5 per Cent.
Sulphur . . . . . 0·58 „
Ash . . . . . 2·73 „

For Price, &c., apply to the

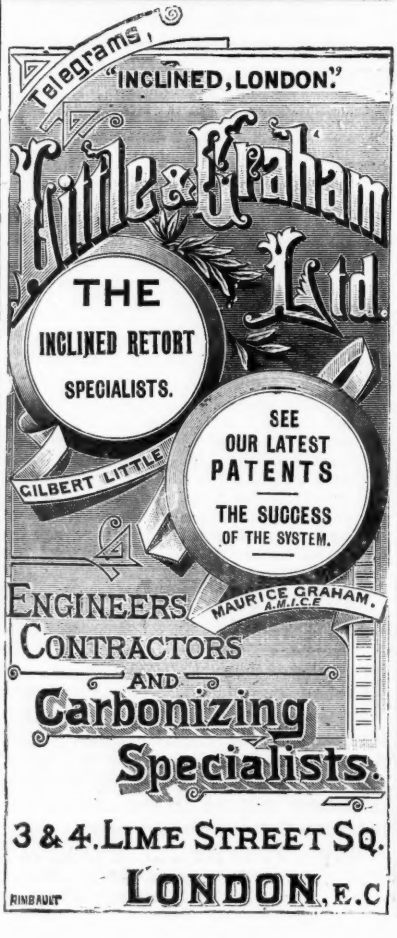
WEARDALE IRON & COAL Co., LD.

QUAYSIDE, NEWCASTLE-ON-TYNE.

THE DRUM

FOR PUMPING AIR, WATER, SEMI-FLUIDS, &c.

See Advertisement in last and next issue.



HUNTER'S

OXIDE OF IRON.

JAMES HUNTER, MINER, AND SHIPPER OF NATURAL IRISH BOG ORE.

This Estate yields the finest and most uniform quality in Ireland; and the quality is guaranteed.

Samples and Prices on application.

5, PRINCES STREET, PORT GLASGOW.

Telegrams: "HUNTER, PORT GLASGOW."

Established 1872.

Following the acquisition of new Works situated in the heart of the cheapest Coal, Iron, and Steel Districts, we have added to our Technical Staff the MOST SUCCESSFUL MODERN EXPERTS in the designing of

AUTOMATIC COAL & COKE HANDLING PLANTS

WE EARNESTLY WISH ENGINEERS TO INSPECT OUR LATEST DESIGNS.

New CONVEYOR Co., Ld.,

3 & 4, Lime Street Square, London, E.C.

Awarded HIGHEST MEDAL and DIPLOMA at the Newcastle-on-Tyne Royal Mining and Industrial Exhibition, 1887, for

CANNEL & COAL.

TYNE

BOGHEAD CANNEL.

Yield of Gas per ton . . . . . 13,155 cub. ft.
Illuminating Power . . . . . 38·22 candles.
Coke per ton . . . . . 1,301·88 lbs.

EAST PONTOP GAS COAL.

Yield of Gas per ton . . . . . 10,500 cub. ft.
Illuminating Power . . . . . 16·3 candles.
Coke . . . . . 70 per cent.

SOUTH PELAW MAIN GAS COAL.

Yield of Gas per ton . . . . . 10,500 cub. ft.
Illuminating Power . . . . . 16·3 candles.
Coke . . . . . 73·1 per cent.

For Prices and complete Analysis, apply to

THOS. W. DANCE & SONS,

COAL OWNERS, NEWCASTLE-ON-TYNE;

OR

E. FOSTER & CO.,

12, JOHN STREET, ADELPHI, LONDON, W.C.

PRELIMINARY ANNOUNCEMENT OF FIRST ISSUE OF SHARES.

THE

Champion Incandescent Gas-Lamp Company,

LIMITED.

This Company has been formed for the thorough

EXPLOITATION OF INCANDESCENT AND OTHER LIGHTS

In the United Kingdom, and has acquired, and is now treating with holders of, several important Patents for Mantles and Burners.

The Present CAPITAL of the Company is to be only £15,000 in £5 Shares, of which a considerable part is already subscribed abroad and in England; this being considered by the Directors amply sufficient for a first issue.

PROSPECTUSES ON APPLICATION TO THE SECRETARY.

THE BENEFITS of INCANDESCENT LIGHT have already been so thoroughly thrashed out that they need not here be again repeated. There is now such *an immense demand* for this Light (the public fully recognizing the superiority of it) that there is ample scope for other Companies; those existing being unable to keep pace with the demand.

OUR SPECIALITY IS A PERFECTED MANTLE

(for which we have the Sole Rights in England and the Colonies), of a Subdued Light Golden Colour, specially adapted for the Drawing-Room, and is not in any way trying to the complexion, as it does not give the ghastly appearance of the white light now in use. It is also much recommended for the Windows of Large Establishments, to show off the delicate Colours of different Fabrics.

These Mantles give a light of 80-Candle Power, and are much stronger and more durable than any other in the Market. Our White Mantles have also been very much improved, are very durable, and give a perfect white light.

We do not wish to imitate our Competitors by extravagant promises, advertising what we cannot supply. Our arrangements are in perfect working order; and Orders are now being executed with all possible speed.

Our Burners are a NEW PATENT; and our numerous Customers testify to the SUPERIORITY of the same over all others in the Market.

The demand for the "CHAMPION" LIGHTS is increasing daily. They are already very much in use in different large Establishments, notwithstanding the threatening Public Notices of our competitors, who apparently consider themselves entitled to a monopoly of the Incandescent Business.

The "CHAMPION" INCANDESCENT SPIRIT LAMP is already in Stock; and the "CHAMPION" OIL-LAMP is in preparation, and will be ready for next season. Other Startling Inventions will be announced shortly, which must materially benefit the Company.

All Purchasers, Dealers, and Users of the "CHAMPION" INCANDESCENT LAMPS will be fully INDEMNIFIED AGAINST LEGAL PROCEEDINGS threatened by Trade Rivals.

SPACIOUS SHOW-ROOMS WILL BE OPENED IN THE DIFFERENT LARGE TOWNS IN THE NEXT TWO WEEKS.

Catalogues of New Goods are in preparation; but, owing to the many Novelties, they cannot be ready for a few days.

Orders can be executed at once, as we have a large Stock ready for immediate delivery.

The Company have ample Working Capital in hand.

The Trade will be liberally dealt with; but Shareholders will have a preference as to Agency.

Temporary Address: 16 & 17, GREAT ST. HELENS, LONDON, E.C.

TROTTER, HAINES, & CORBETT,
Brettell's Estate
FIRE-CLAY & BRICK WORKS,
STOURBRIDGE.

Manufacturers of GAS-RETORTS, GLASSHOUSE FURNACE & BLAST-FURNACE BRICKS, LUMPS, TILES, and every description of FIRE-BRICKS.
Proprietors of
BEST GLASSHOUSE POT & CRUCIBLE CLAY.
SHIPMENTS PROMPTLY AND CAREFULLY EXECUTED.

LONDON OFFICE: R. CULL, 31, OLD BROAD ST., E.C.

TO ENGINEERS & MANAGERS.
ESTABLISHED OVER 50 YEARS.

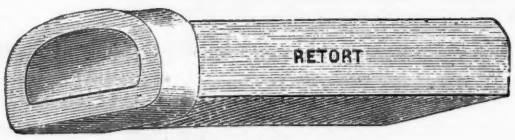
This is to certify that I, SAMUEL NELSON, am the only ORIGINAL MAKER of the SOLID LEAD SATURATOR, or the CASED SATURATOR.
All Estimates given free for Lead Chemical Burning, and also Contracts for Sulphate Saturators.
Note Address—
20, SPRING GARDENS, BOLTON, Lancashire.
Please write for Estimate before ordering elsewhere.

UNEQUALLED.
Gas Companies are solicited to try Samples of the
MIRFIELD
BLACK BED GAS COAL.
Prices and Analysis on application.
MIRFIELD (GAS-COAL) COLLIERY COMPY.
RAVENSTHORPE, NEAR DEWSBURY.

PHILADELPHIA EXHIBITION, 1876.
ALSO SILVER MEDAL, PARIS.

The Highest Award for Gas-Retorts and other Goods in Fire-Clay has been awarded to KING BROTHERS for their Goods made from their renowned Stourbridge Fire-Clay.

KING BROTHERS,



Proprietors of
STOURBRIDGE CLAYS,
Manufacturers of
Fire-Bricks, Tank Blocks, Glass-House Bricks and Pots, Gas-Retorts, Crucibles in Clay and Plumbago, Gas-Oven Bricks, Bricks for Regenerator Furnaces and Hot-Air Stoves.
STOURBRIDGE, ENGLAND.
CRUCIBLE MANUFACTORY, 46, PENN STREET, CURZON STREET, BIRMINGHAM.
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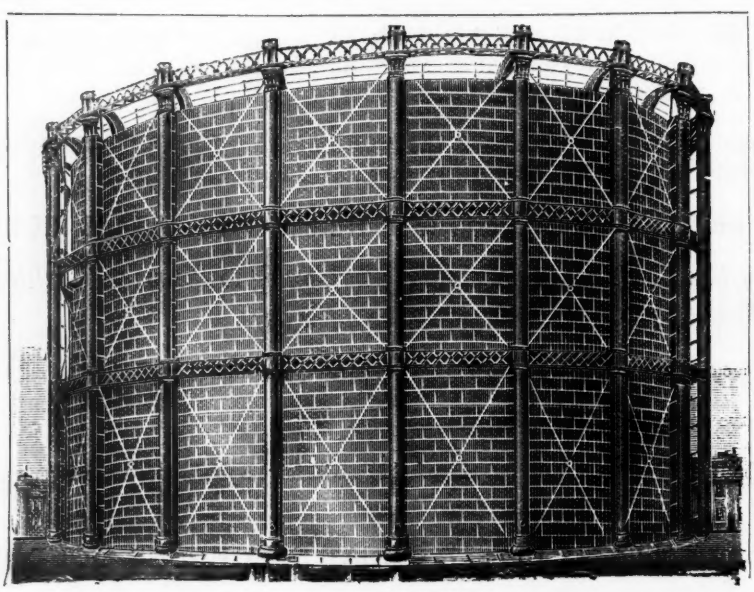

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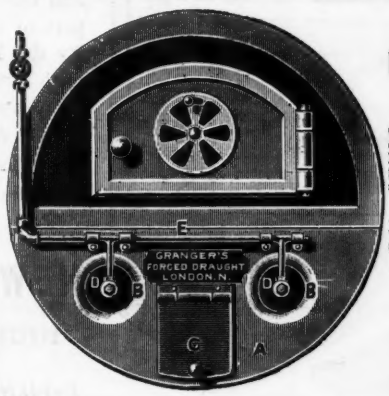

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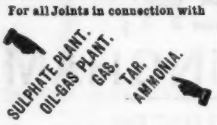

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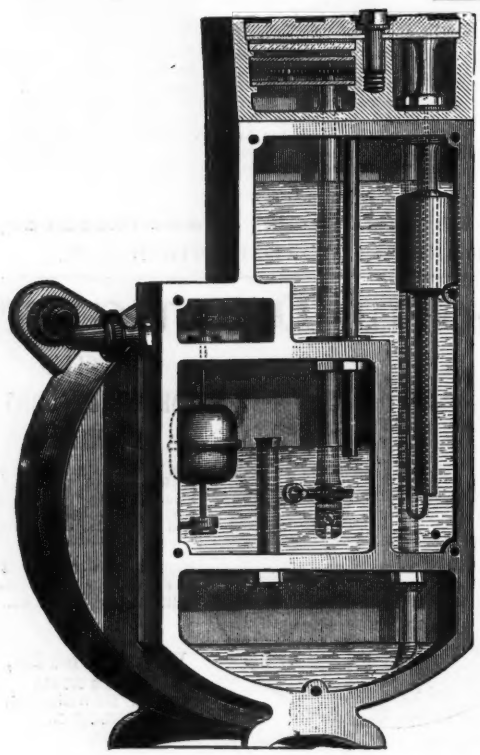

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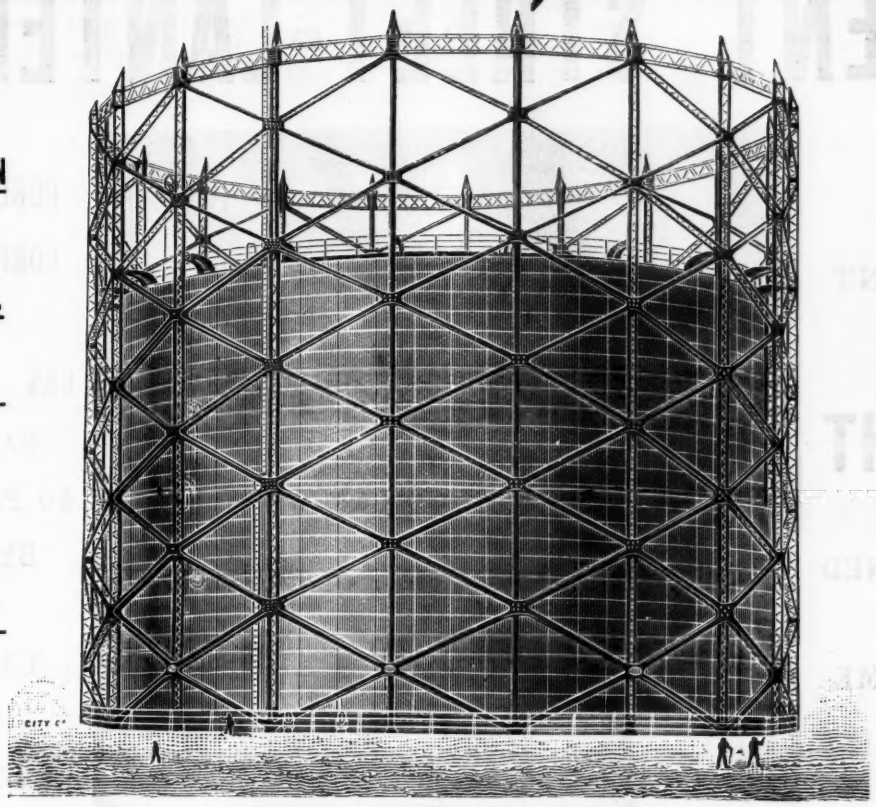

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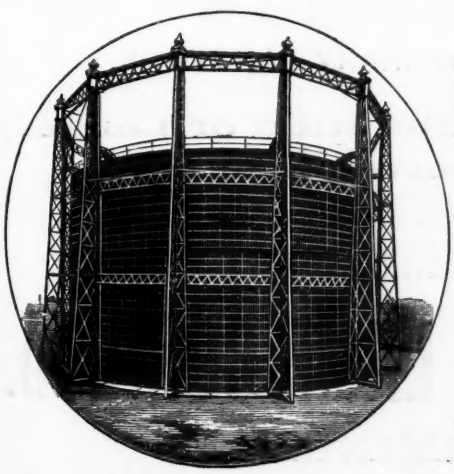

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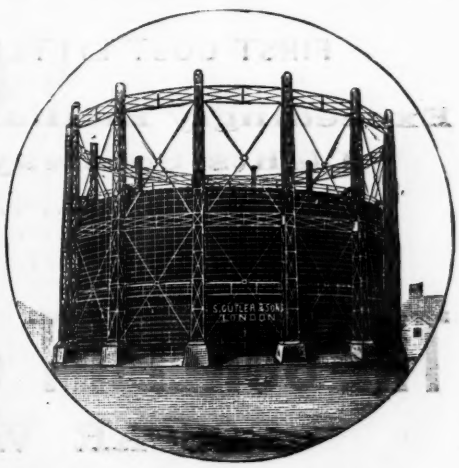

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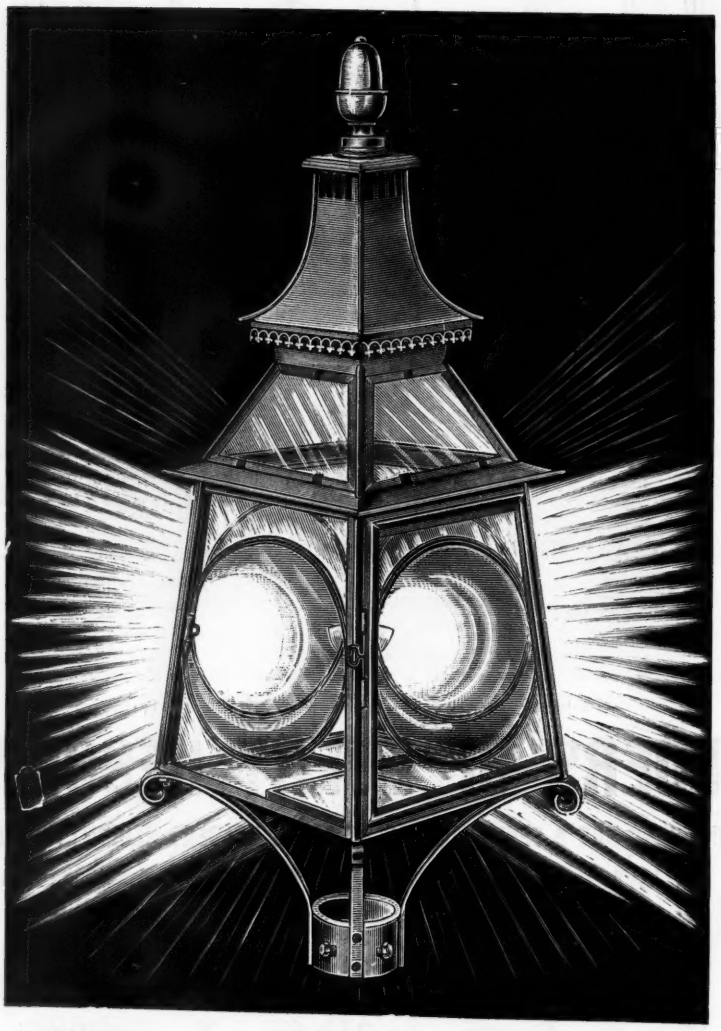

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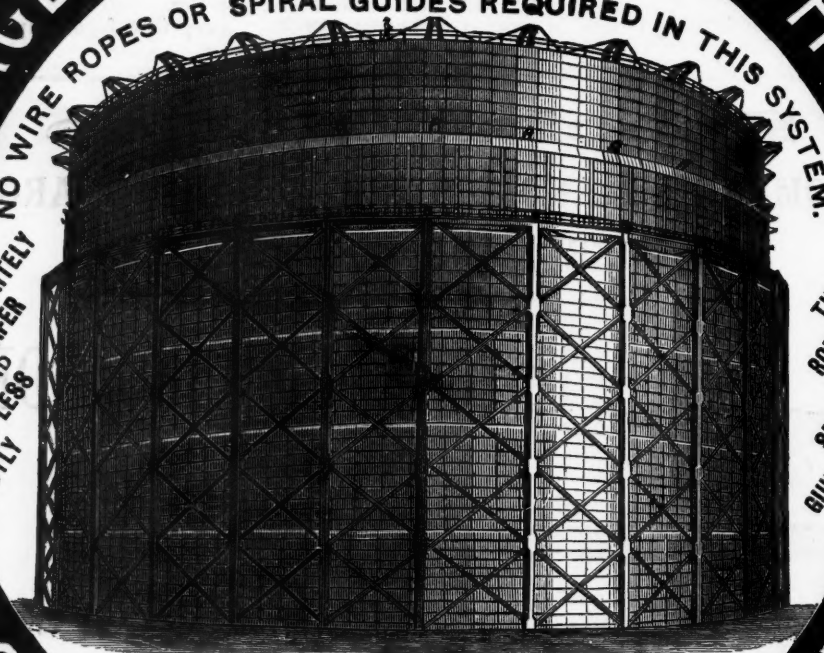

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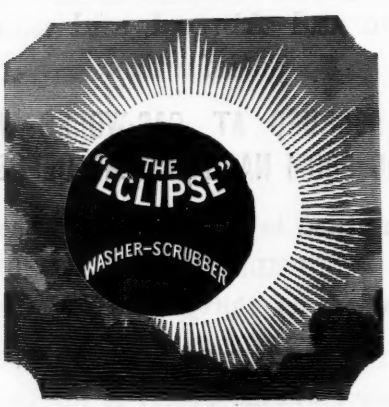

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